NELSON COAL SITE RECLAMATION PROJECT

DSL - AMRB No. 93-013

FINAL REPORT

Cascade County in Central, Montana

May 20th, 1995

SPECTRUM ENGINEERING

Billings, Montana

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Cascade County, Montana

SPECTRUM ENGINEERING

MINING & CIVIL ENGINEERS

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FINAL REPORT

NELSON COAL SITE RECLAMATION PROJECT

MT DSL-AMRB No. 93-013

Cascade County, Montana

Site Located in Sand Coulee, Montana

T19N, R4E, NE¼SW¼, N½SE¼, & S½NE¼ of Section 13

May 20th, 1995

Spectrum Engineering
1413 4th Avenue North
Billings, Montana 59101

PLEASE RETURN

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NELSON COAL SITE RECLAMATION PROJECT

1. INTRODUCTION

1.1 Project Description

The project was designed to fill subsidence features, to address acid mine seepage and to stabilize slopes in a previously reclaimed area on the ridge behind Sand Coulee. The subsidence features included a previously backfilled shaft (12 feet deep), thirty subsidence holes (ranging from 2½ feet to 10 feet deep), and thirty-one subsidence cracks in the massive sandstone on top of the ridge (ranging from 1 foot to 12 feet deep). Coulee stabilization was to be accomplished by grading; backfilling; planting grass and shrubs; constructing a limestone core drainage channel through the middle section of the drainage; and replacing a 12-inch diameter storm drain through a developed area at the bottom of the drainage. Associated work included fencing, gravel road construction and repairing construction to roads in the town.

1.1.1 Location and Access

The Nelson Coal Site Reclamation Project is located in the NE¼SW¼, N½SE¼, & S½NE¼ of Section 13, T19N, R4E in Cascade County. General access is by proceeding east from Great Falls on Highway 87/89 to Secondary 227. Then proceed south on 227 to Sand Coulee. The site is situated on the ridge running along the east side of the town. The Nelson Coal Site is found on the 7½ minute USGS quadrangle named Southeast Great Falls, Mont. at latitude 47°23'52" and longitude 111°09'55".

1.1.2 Land Ownership

The site is owned by the following landowners:

SITE NAME	LOCATION	LANDOWNER/CONTACT
New Storm Drain and Coulee Access Road	A portion of NE¼NE¼SW¼ Section 13, T19N, R4E	Keith and Vicky Reeves Sand Coulee, MT 59472 (406) 736-5388
New Storm Drain and Coulee Access Road	A portion of NE¼NE¼SW¼ Section 13, T19N, R4E	Richard and Terry Weil Sand Coulee, MT 59472 (406) 736-5564
New Storm Drain, Coulee Access Road, and Coulee Stabilization	A portion of E½NE¼SW¼ Section 13, T19N, R4E	Gary Giannini Sand Coulee, MT 59472 (406) 736-5175
Coulee Stabilization Crack, Subsidence Closures and Access	S½SE¼, SE¼SW¼ NW¼SE¼, a portion of the NE¼SW¼ all in Section 13 N½NE¼ and NE¼NW¼ of Section 24, T19N, R4E	Ken Jarvi 101 East 9th Ave. Suite 9B Anchorage, Alaska 99501 (907) 276-4271

Cracks and Shaft Closure	The majority of the NE¼ and the NE¼SE¼ of Section 13, T19N, R4E	Renee Lynch P.O. Box 71 Sand Coulee, MT 59472 (406) 454-2829
Access to Cracks and Coulee Stabilization	NW¼NW¼ of Section 24 a portion of E½NE¼NE¼ Section 14, T19N, R4E	Ernest and Marilyn Chartier Sand Coulee, MT 59472 (406) 736-5366

1.1.3 History

A history of mine development in the area surrounding this site can be found in the *Cultural Resource Inventory and Evaluation for Griffen, Antelope Creek, Upper Cottonwood (A), Upper Cottonwood (B), Upper Cottonwood (C), Tracy N.E., Stockett-Western, Cottonwood Coal Company No. 3, 4 and 5, Tracy, Tesinsky, Brown Rear Tunnel, Dahn, Nelson No. 1, Mount Oregon, Frantzich and Nelson No. 2 Mines in the Sand Coulee District, Montana* authored by Paul Anderson for GCM Services, Inc. and dated September 21, 1983. The sections on the Dahn Mine and the Nelson No. 1 Mine provide references to this site. The disturbance in Miners Coulee on the eastern edge of Sand Coulee, is probably related to a prospect tunnel which was driven in the 1930's by the Nelson Mine and which was abandoned during the same period after fire was encountered in the seam. The cracking, the subsidence, and the shaft could be associated with either the Nelson Prospect or the Dahn Mine. The Nelson Prospect and the Dahn Mine were probably reclaimed in 1983 or 1984. Work in Miners Coulee involved removing and covering mine wastes, revegetation of the cover soil, and installation of a french drain and discharge system to remove seepage occurring at the base of the coulee. Portals at the Dahn Mine were also sealed during this period.

In 1986, the DSL received notice that this site was venting gas and subsiding. The site was given a PA Name of SD COULEE RIDGE FIRE. Seventeen (17) temperature probes were installed on the ridge and were monitored in 1987 and 1988. About half of the probes indicated elevated ground temperatures.

In May 1993, Thomas, Dean & Hoskins, Inc. began another site investigation based on resident complaints regarding sedimentation and stormwater problems downhill from previously reclaimed Miners Coulee. Aerial observation of subsidence cracks also contributed to the decision to reinvestigate this site.

1.2 Project Objectives

The project objective was to eliminate physical hazards posed by open cracks and subsidence openings; and to alleviate downstream drainage system problems by stabilizing the slopes in Miners Coulee. Addressing acid mine seepage was a secondary objective.

2. RESPONSIBLE PARTIES

2.1 Contractor

The successful bidder (only bidder) was Shumaker Trucking and Excavating. Their address is shown below:

Shumaker Trucking and Excavating
P.O. Box 1442
Great Falls, MT 59043
Phone: 406/727-3537
MT Contractor's License: 5199A

2.2 Reclamation and Engineering Plan

Thomas, Dean & Hoskins Inc., Engineering Consultants was assigned the responsibility of preparing the reclamation and engineering specifications prior to contractor selection. Spectrum Engineering prepared project bid packages based on Thomas, Dean & Hoskins draft bid documents.

Thomas, Dean & Hoskins' address is shown below:

Thomas, Dean & Hoskins
1200 - 25th Street South
Great Falls, Montana 59405
Phone: 406/761-3010

2.3 Quality Control Inspection

Spectrum Engineering performed the quality control inspection. Vern Heisler performed project engineering functions and Hank Lowe acted as the construction inspector.

Spectrum's address is shown below:

Spectrum Engineering
1413 4th Avenue North
Billings, Montana 59101
Phone: 406/259-2412

2.4 AMRB Coordination

The AMRB Project Manager was Dan Koszuta, Montana Department of State Lands, Abandoned Mine Reclamation Bureau. John Koerth assumed this responsibility after Dan Koszuta left the project during the winter shutdown.

3. CHRONOLOGICAL LISTING OF EVENTS

3.1 Pre-Bid Conference

A pre-bid conference was held at the site near Sand Coulee on September 14th, 1994. Dan Koszuta represented the AMRB and Vern Heisler represented Spectrum Engineering. The meeting was attended by several prospective contractors.

3.2 Bid Date

The bid opening date was September 21st, 1994 at 2:00 p.m. at the Montana Department of State Lands, Abandoned Mine Reclamation Bureau's office, 1625 Eleventh Avenue, Helena, Montana.

3.3 Lowest Bids

Only one (1) qualified bidder responded to the solicitation. The bid was submitted by Shumaker Trucking & Excavating for $269,395.50. The Engineer's estimate was $242,139.50. The bid tabulations is presented in ATTACHMENT 1.

3.4 Contract Award

The contract was awarded to Shumaker Trucking & Excavating who was the only bidder. The prime contractor's address is shown under 2.1 Contractor above.

3.5 Contract Agreement

The Contract Agreement was signed October 27th, 1994. The Notice to Proceed was issued on October 27th, 1994 for a starting date of November 1st, 1994. The contractor was to complete the specified work within thirty (30) consecutive calendar days for an anticipated completion date of November 30th, 1994. The number of calendar days was subsequently increased to 41 days. The scheduled work was completed on April 26th, 1995.

3.6 Construction Start-up

A Pre-construction Conference was held at the site on October 31st, 1994. Shumaker Trucking & Excavating started moving equipment to the job site and started work on November 1st, 1994.

3.7 Change Orders

Three Change Orders were written for this project. Copies of the Change Orders are included in ATTACHMENT 2 of this report. Change Order No. 1 was issued to pay the Contractor $940.00 for repair of the Sand Coulee water main which broke during construction. The breakage was attributed to the condition of the pipe and was not the fault of the Contractor. An additional day was granted for this work. Change Order No. 2 was issued to pay the Contractor $502.00 for drainage ditch grading which was added at the request of a resident. Adjustments to correct the estimated quantities to actual measured quantities for completed bid items were also included in

Change Order No. 2. Change Order No. 3 was issued to pay the Contractor an extra $1232.00 to substitute a 2-inch overlay of asphalt for replacement of the gravel base and new pavement for road repair. An adjustment to correct the estimated quantities of bank stabilization fabric to actual measured quantities was also included in Change Order No. 3. Bid unit prices were used for the adjustment of bid and actual quantities which amounted to a net decrease of $6559.12 for the project.

3.8 Work Stoppages

Shumaker Trucking & Excavating started work on November 1st, 1994 and completed all work on April 26th, 1995. A winter shutdown commenced on December 8, 1994 after bad weather had caused numerous delays and temporary shutdowns. Work restarted on March 20, 1995, with the contract extended an additional 11 days for weather delays and extra work. After working through March 22nd, 1995, another stoppage occurred as the Contractor waited for Spring temperatures to rise for street paving. The paving work was completed on April 26th, 1995. The original contract period was 30 days. This contract period was extended to 41 days. The contractor spent 177 days on the site. This included 136 days of weather shutdown, 30 working days, and 11 scheduled non-working days.

3.9 Requests for Payment

Four payment requests were made during this project. A copy of each Pay Request is included in ATTACHMENT 3. A 10-percent retainage was withheld on the first three requests. The payment amount for each request is shown below:

No. 1	11/01/1994 to 12/01/1994	$156,128.36
No. 2	12/01/1994 to 12/09/1994	$ 66,193.69
No. 3	12/10/1994 to 03/22/1995	$ 7,246.69
No. 4-Final	03/22/1995 to 04/27/1995	$ 34,937.64

3.10 Substantial Completion

The date of Substantial Completion was December 13th,1994.

3.11 Final Completion and Approval

A field inspection by the AMRB took place on May 1st, 1995. The Final Completion Date is one year from the Substantial Completion Date or December 13th, 1995.

3.12 Final Payment

Final payment was made to the Contractor on May 8, 1995. A copy of the payment request has been included in ATTACHMENT 3.

4. CONSTRUCTION

4.1 Description of Project Plan

Coulee stabilization - To stabilize the walls of the coulee, a fill plug would be placed against the existing slope as a buttress against further movement of the slopes. Due to the seepage occurring along the face of the existing coulee slopes, a drainage layer would be required under the fill to intercept this seepage. Therefore, a rock core down the center of the coulee with granular fill on both sides would be used in combination with terracing of exposed rock slopes to reshape the coulee. The rock core would serve as a durable fill material and would provide a seepage pathway and channel lining. Limestone would be used because it is durable and because it could add some alkalinity to the downstream drainage system. Rock used for the core would be obtained from a properly licensed and permitted borrow source. The material should contain no less than 90% calcium carbonate. The gradation of the lime rock would be as follows:

Weight of Stone (lb)	Equivalent Spherical Dia. (ft.)	Percent of Total Weight Smaller than Given Size
1500	2.60	100
800	2.10	90-70
400	1.67	60-40
90	1.00	0-10

The rock would be openly graded to permit water flow. The core would be placed in an excavated trench with a bank stabilization fabric equal to Mirafi 700X installed along the bottom to prevent erosion. Above and below the core, short channel sections would be incorporated into the drainage. These channels would also be lined with limestone on top of a filter fabric. The limestone would have the following gradation:

Weight of Stone (lb)	Equivalent Spherical Dia. (ft.)	Percent of Total Weight Smaller than Given Size
100	1.05	100
60	.88	90-70
25	.66	60-40
2	.27	0-10

The granular fill on the sides of the core would be obtained to the degree possible from the terracing operation. The remainder of the fill material would be obtained from a properly licensed and permitted borrow source. This fill would be placed in lifts of maximum 8 inch loose thickness and compacted to a minimum of 85 percent of the maximum AASHTO T-99 dry density at ±3 percent of optimum moisture content. Imported material should conform to the following gradation:

Screen or Sieve Size	Percent Passing by Weight
6 inch	100
3 inch	85-100
No. 4	25-45
No. 200	0-10

Topsoil would be placed on the regraded slopes on either side of the core and the area would be revegetated with native grass, trees and shrubs to control erosion. A hay bale dike would be constructed around the top perimeter of the core to catch sediment until vegetation was established. Because no cover soil borrow area exists on site, cover soil would be imported to the site and would be evenly spread to a depth of 12" after compaction of all prepared areas. After placement of cover soil and final grading, the surface of the cover soil would be finished with a thorough "tracking" parallel to the contour of the slope by a track type tractor with deep lug grousers.

The dressed area would be fertilized, seeded and mulched. Fertilizer would be applied to the prepared seedbed prior to seeding or mulching and would be blended with the topsoil or cover soil as called for in the Technical Specifications, or concurrently with the seed (as "no-till" drills allow). All areas would be fertilized with an inorganic chemical fertilizer with the following nutrients:

Nitrogen (Elemental)	22.5 ± 1.0 lbs/acre
Phosphorus ($P_2 0_5$)	56.0 ± 1.0 lbs/acre
Potassium ($K_2 0$)	14.0 ± 1.0 lbs/acre

The following seed mixture would be used:

Common	Seed Mix Scientific	Variety	(lbs PLS/acre)*
Pasture Seeding Mix:			
Thickspike Wheatgrass	Agropyron dasystachyum	Critana	4.0
Western Wheatgrass	Agropyron smithii	Rosanna	4.0
Slender Wheatgrass	Agropyron trachycaulum	Primar	4.0
Prairie Sandreed	Calamovilfa longifolia	Goshen	2.0
Green Needlegrass	Stipa viridula	Lodorm	4.0
Sainfoin	Onobrychis viciaefolia	Eski	3.0
Alfalfa	Midigo sativa	(dryland)	1.0
Blue Flax	Linum lewissi	Appar	1.0
Total			23.0

*Pounds pure "live seed" per acre.

A grass hay mulch would be applied at a rate of 3,000 pounds per acre in accordance with Technical Specification 330.00 Mulch. Grass hay mulch must be anchored by a mulch tiller (crimper). Mulch will be "Montana certified weed seed free".

Shrub and tree seedlings would be planted at specified locations. The Contractor would supply tree and shrub seedlings as container growth stock. Fertilizer for use in mixing with the improved topsoil in the planting holes would consist of the following guaranteed percentages:

Total Nitrogen: 7%	Total Potash: 6%
Total Phosphorous: 40%	Total Magnesium: 12%

The types of trees or shrubs would be as specified in the following table:

Tree or Shrub		Quantity Supplied	Root Preparation	Minimum Height (inches)
Common Name	Scientific Name			
Mountain Alder	*Alnus incana*	20	Container	6
Choke Cherry	*Prunus Virginianna*	30	Container	6
Service Berry	*Amelanchier alnifolia*	10	Container	6
Woods Rose	*Rosa woodsii*	15	Container	6
Creeping Juniper	*Juniperous horizon talis*	15	Container	6

Approximately 200 linear feet of type F-4 farm fence would be removed for construction access. This fence must be replaced at the end of the project. Clearing and grubbing of the project area may be required to complete the reclamation work. Disposal of debris, trash, vegetation, etc., would be disposed of off-site at a properly licensed landfill. Burning would not be permitted on this project. Straw bale dikes or silt fences would be required on the down slope side of all topsoil storage piles, in the drainage outlets from the site and any other location directed by the owner. Coulee stabilization was expected to involve approximately 3,200 tons of imported lime rock, 7,750 cubic yards of excavation, 1,950 cubic yards of imported cover soil and 1.8 acres of revegetation.

Downstream drainage improvements - Since the existing 12-inch concrete pipe which carries runoff from the coulee to a ditch along Dahn's Lane is clogged with sediment, it would be replaced with a 15-inch pipe capable of handling up to the 10 year storm. A lined channel would be constructed from the end of the rock core drain to the inlet of the new pipe. The outlet end of the culvert would also be protected with limestone riprap. The bottom section of the concrete pipe would be installed down the middle of Miner's Lane; so, damage to the road system would need to be repaired.

The Contractor would be required to remove and dispose of the existing buried 12" storm drain pipe and then install 553 lineal feet of new 15-inch reinforced concrete pipe with two manholes. One water line and one water service line must be deflected to provide 18" and 12" clearance respectively from the new 15" pipe. This work would include providing the AWWA C900 pipe and fittings required to route the water main under the new storm drain. Reinforced concrete pipe would conform to ASTM C-76 and Subsection 610 of the Standard Technical Specifications. Manholes would conform to the requirements of Section 620.02(D) and Standard Drawing No. 620.03 of the Technical Specifications.

Following installation of the new 15" drain pipe and the two manholes, reconstruction of the existing gravel road (Miner's Lane) from the coulee stabilization area to Dahn's Lane would be required. The road repair work would include regrading and placement of a 6" thick layer of 1½" minus gravel. Gradation shall conform to the requirements of Grade 2 (1½" minus), Paragraph 810.02 (D) of the Technical Specifications. The gravel course would be compacted to 95% of its maximum AASHTO T-99 dry density at ±2 percent of optimum moisture.

Acidic seep - The inlet to the newly constructed concrete pipe drain would be located near the source of the acidic seepage. Seepage would enter the pipe and would be routed through the stormwater system. Revegetation and closure of cracks providing infiltration routes for surface

water would serve to reduce the amount of seepage. In addition, surface water runoff through the limestone core would mix with the acidic seepage diluting and buffering it to some extent.

Shafts, Cracks, and Subsidence - One shaft, 31 cracks, and 30 subsidence holes require backfilling involving approximately 500 cubic yards of imported fill and approximately 900 cubic yards of imported granular backfill. Any topsoil would be salvaged and replaced. The imported material would conform to the following gradation:

Screen or Sieve Size	Percent Passing by Weight
6 inch	100
3 inch	85-100
No. 4	25-45
No. 200	0-10

The shaft would be filled with imported fill material. One fence would be removed and replaced to allow access to this site. Boulders near the top of the shaft would be removed for access and then replaced after the opening had been filled. Imported material would be used to fill the shaft to the level of the surrounding ground. Cover soil would then be replaced and the surface revegetated by broadcast seeding, fertilizing, and hand crimping mulch over the surface.

Subsidence holes would be filled with adjacent and imported materials and graded to blend with the surrounding ground surface. All topsoil which might be disturbed by this operation would be salvaged prior to backfilling. Cover soil would then be replaced and the surface would be revegetated by broadcast seeding, fertilizing, and hand crimping mulch over the surface.

Type 1 cracks would be filled with compacted gravel. Type 2 cracks would first be excavated and then filled with compacted gravel. The goal would be to eliminate the physical hazards posed by the openings. The work would consist of importing and placing granular backfill, excavating and placing existing material, grading and revegetation. Granular material used to backfill cracks would conform to the requirements for crushed base course. Granular material would be obtained from a properly licensed and permitted borrow source. Backfill of cracks would be accomplished by carefully pouring the imported gravel into the opening. Following each 12 inches of depth filled, the gravel would be hand tamped to maximize the depth of penetration of the gravel into the crack. Gravel would be mounded over the cracks. Gravel placed above the top of the crack would be placed in lifts not exceeding 12" in thickness and compacted to 90 percent of it maximum AASHTO T-99 dry density at ±3 percent of optimum moisture content. Where existing ground is excavated down to rock the native material would be replaced and compacted in a similar manner. Cracks with compacted native material overlying rock would require topsoiling and revegetation after final grading. All disturbed areas would be broadcast seeded and fertilized. Mulch would be applied and hand crimped over the vegetated areas. Where mounded soil will interfere with surface water drainage, appropriate grading shall be accomplished to divert runoff around the mounds and maintain positive drainage.

Asphalt Pavement Replacement Option - At the end of the project construction the asphalt roadways used during construction for truck traffic, etc., would be visually inspected by the owner to determine if damage had occurred as the result of this construction project. At the discretion of the owner, these deteriorated sections (if found) would be repaired by the contractor. This will require replacing those sections as directed by the owner with 2" of asphalt and 6" of gravel.

4.2 Major Equipment List

Type	Make/Model	Size/Horsepower	No. on Job
Bulldozer	John Deere/450D	67 Hp	1
Bulldozer	Caterpillar/D-8H	235 Hp	1
Bulldozer	Caterpillar/D-6C	155 Hp	1
Skid Steer Loader	Case/1845C	½ yd/51 Hp	1
Excavator	Caterpillar EL 300	187 Hp	1
Loader	Caterpillar/966 D	4¼ yd/200 Hp	1
Grader	Caterpillar/140 G	150 Hp	1
Backhoe	Caterpillar/436 B	1..38 yd/84 Hp	1
Backhoe/Loader	Caterpillar/416	1 yd/74 Hp	1
Guided Compactor	Bomag/BW60S	7.1 Hp	1
Dump Truck	Mack	14 yd	3
Service Truck	International/190		1
Tractor	Case/995		1
Crimper	Homemade	8 foot	1
Seed Drill	Brillion	6 foot	1
Truck/trailer	(Sub-Contractor)	63 Ton/14 Ton GVW	3
Truck/trailer	(Sub-Contractor)	58 Ton/14 Ton GVW	1
Transport	Kenworth		

4.3 Contractor Employees

The contractor had from three (3) to eight (8) employees working on the job site on various days. In addition, Neway Company out of Missoula and La Velle from Butte provided five trucks and drivers to haul limestone. Riverside Paving provided the equipment and personnel for asphalt repair.

4.4 Construction Activities

A pre-construction meeting was held on October 31, 1994, with Daniel Koszuta from DSL, Gene Shumaker, Joe Aline, Ken Carlstad from Shumaker Construction Company, Vern Heisler and Henry Lowe from Spectrum Engineering. Richard Wiel from Sand Coulee Water located the 4 inch water main and 3/4 inch water service.

The project started on November 1, 1994. Lindseth Survey Company staked out the alignment for the 15 inch reinforced concrete pipe (RCP) storm drain. The 12 inch storm drain pipe was removed and disposed of. Then the new 15 inch RCP was installed. Between manhole #1 and manhole #2 the pipe was installed on the specified grade. However, for 155 feet southeast of manhole #2 the pipe's designed grade was modified. In order to accommodate the grade modification, an additional manhole, MH #3, was installed and another grade change was made between MH #3 and the RCP inlet to reach the specified inlet elevation. Following pipe installation, that portion of Miner's Lane east of Dahn's Lane was reconstructed with 6 inches of road material gravel.

The 4 inch water main had 18 inches of clearance between the bottom of the 15 inch RCP and the top of the 4 inch water main without adjustment. When the 4 inch water main was shut off the water main broke at the City Fire Hall. Shumaker repaired it.

Rock slope excavation was done on both sides of coulee. Benches were cut in with a D-8 Cat Dozer. The excavated material was used to regrade the coulee. The coulee was rebuilt with the rock core and channels as specified. Lime rock was placed up the center with bank stabilization fabric placed under and on the sides of the lime rock. Lime rock was obtained from Spokane Minerals Ltd. in Winston, Montana and was hauled to the site by five truck/trailer rigs operated Neway Company out of Missoula and La Velle from Butte.

Amoco 1199 Type filter fabric was utilized as the bank stabilization fabric. Dan Koszuta approved the size of lime rock that was being put in. An additional 300 tons of imported fill was hauled in to supplement that material which was stockpiled during the excavation of the coulee slopes. The Contractor imported 1950 cubic-yards of cover soil to dress the slopes with 1 foot of material. Straw bales were installed along the perimeter of the lime rock drainage core. Seed, fertilizer, and straw mulch were then applied. Containerized tree and shrub seedings were planted on December 10, 1994. A type F-4 farm fence was installed around the perimeter of the project area as planned.

The 30 subsidence holes and 31 cracks were backfilled according to specifications. Cover soil was excavated from the cracks and subsidence holes and then replaced.

On March 20, 1995 Shumaker started up after the winter shut down and finished seeding, fertilizing, and mulching cracks #20 - #31, subsidence #1 - #30, their haul road, and all other disturbed areas. The Contractor also staked down the straw bales in the dike along limestone drain, placed lime rock at the head of the coulee and planted 15 more shrubs. The shaft was backfilled as specified on March 21, 1995. The ditch along Dahn's Lane was excavated for 215 feet to encourage the 15 inch RCP to drain.

On April 26, 1995, Riverside Paving milled the existing pavement between Dahn's Lane and the highway plus a short section on Dahn's Lane and part of Main Street in front of the post office. They completed paving these sections the same afternoon.

4.5 Quantities Used

All work items except mobilization and work on the water main were bid on a unit price basis. An on-site construction inspector measured items for payment and recorded load counts. Bid quantities were adjusted based on field measurements.

Item	Amount	Unit Cost
CLEARING AND GRUBBING	1.4 Ac	$500.00 per Ac
EXCAVATE, STOCKPILE AND REPLACE UNCLASSIFIED MATERIAL	7750 CY	$3.75 per CY
PROVIDE AND PLACE LIME ROCK		
+1 foot dia -2.6 foot dia	3251 Tons	$32.00 per Ton
+3¼ inch dia - 1 foot dia	225 Tons	$32.00 per Ton
BANK STABILIZATION FABRIC	1719 Sq Yd	$ 2.00 per Sq Yd
ROCK EXCAVATION	100 CY	$15.00 per CY
IMPORT GRAVEL FILL		
+1/8 inch -6 inch	300 Tons	$8.00 per Ton
IMPORT COVER SOIL	1950 CY	$7.00 per CY
BACKFILL SUBSIDENCE CRACKS		
+1/8 inch -6 inch gravel	818 CY	$15.00 per CY
BACKFILL SUBSIDENCE HOLES		
+1/8 inch -6 inch graveL	1040 CY	$9.00 per CY
BACKFILL SHAFT WITH GRAVEL	80 CY	$25.00 per CY
REMOVE & DISPOSE OF 12" STORM DRAIN	370 Ft	$2.00 per Ft
INSTALL 15" CONCRETE PIPE	561	$30.00 per Ft
INSTALL STORM DRAIN MANHOLES	2 Each	$2000.00 Each
GRAVEL ROAD CONSTRUCTION (6" thick)	1156 Sq Yd	$7.00 Sq Yd
FERTILIZE, SEED AND MULCH	1.8 Ac	$1500.00 per Ac
PLANT SHRUBS	90 Each	$20.00 Each
FENCING (includes panels)	1388 Ft	$2.50 per Ft
STRAW BALES	234 Bales	$10.00 per Bale
2" THICK ASPHALT PAVEMENT	56.6 CY	$135.00 per CY

5. PAYMENT REQUESTS

5.1 Pay Request

Four pay requests were processed for this project as addressed under Section 3.10 above. Copies have been included in ATTACHMENT 1.

5.2 Cost per Site

Site Name	Disturbed Acres	Construction Cost/Acre
Nelson Coal Site	3.25	$81,396

5.3 Total Project Cost

The total project cost was $333,868.44. Of this total, the construction cost for the project was $264,506.38. Shumaker Trucking & Excavating was awarded the contract for an original bid of $269,395.50. Three change orders were issued for a net decrease of $4,889.12.

Total engineering costs for the project amounted to $69,362.06 or about 26-percent of the construction cost. Thomas, Dean & Hoskins Inc., Engineering Consultants performed the site investigations, designed the reclamation plans and specifications, and prepared a draft bid package for those plans. After the AMRB received and approved the plans, Spectrum Engineering was assigned all remaining tasks required to take the project through construction. The engineering cost for Thomas, Dean & Hoskins was $34,249.14. Spectrum Engineering charged $35,112.92 to this project. It cost $6,459.77 to review the mitigation plan, prepare 30 bid packages, attend a Prebid Conference and respond to bidder questions. Construction inspection and project management required an expenditure of $24,620.10. The final report preparation cost was $4033.05. An analysis of the engineering costs versus construction costs is presented in ATTACHMENT 4.

6. PROJECT SUMMARY

6.1 Summary of Project

Thomas, Dean & Hoskins Inc., Engineering Consultants performed the site investigations, designed the reclamation plans and specifications, and prepared a draft bid package for those plans. After the AMRB received and approved the plans, Spectrum Engineering was assigned all remaining tasks required to take the project through construction. Shumaker Trucking & Excavating of Great Falls who was the only bidder was awarded the Contract. The job was started on November 1, 1994 and was completed on April 26, 1995. The contract was estimated to take 30 days; however, poor weather caused several delays and a winter shutdown. The work was completed as designed and bid except for several changes in the quantities, the addition of one manhole in the stormdrain and a change in the manner in which roads were repaired. These changes resulted in a net decrease in the total construction cost. The construction cost was $264,506.38.

Acid mine seepage in Miners Coulee proved to be a greater problem than anticipated in the reclamation plan. Under the design this seepage is collected and routed through the stormdrain to a ditch that runs along Dahn's Lane. Unfortunately, this particular ditch has no outlet, so it acts as a basin. Twice during the winter shutdown, ice accumulated in the drain pipe and plugged the drain. Methods to correct this design problem, are being evaluated and will be implemented under as a separate maintenance task.

6.2 Site Condition after Completion

The cracks, subsidence holes and shaft were filled and the coulee slopes were stabilized correcting much of the problem at this site. However, seeps tended to develop in those areas where the coal seam was exposed and cut. These seeps may tend to acidify the imported soils on the slope below. In addition, the seepage and surface water collection system which was constructed transferred the water disposal problem downhill to the pipe outlet end of the system. Seepage and surface water used to run on the surface and infiltrate into the ground before reaching the lateral ditch at the drain outlet. It now tends to pond in the lateral ditch. During the winter shutdown, the ponding caused the outlet to freeze plugging the drain and causing water to come up through one of the manholes in the road. This problem will need to be addressed by developing escape routes for the water.

6.3 Maintenance or Follow-up

The coal seam could still be burning in the old mines and the massive sandstone near the surface may continue to slowly respond to underground conditions. Consequently, the site should be periodically monitored for subsidence. The stormdrain may be subject to periodic plugging due to accumulations of silt, debris or ice. Because this system is open at both ends, spills into a basin without an outlet and is only 3-7 feet below the ground, water collected from the seep may tend to freeze in the pipe during the winter. This has already happened several times. The establishment of vegetation and possible rilling should also be monitored due to the slope conditions and the acidic seeps. The straw bale dike around the rock core will function as a sediment trap for some time. After it deteriorates, accumulations of silt will need to be periodically removed from the stormdrain system. When the vegetation is checked, the soil conditions in the new seep area on the south side of the coulee should also be inspected.

6.4 Construction Bid Package

Copies of the site plan drawings which were provided in the bid package are located in ATTACHMENT 5 at the back of the final report. These site plan drawings represent the reclamation engineering design (the plan from which the contractors bid the work).

6.5 As-Built Drawings

As-built drawings are located in ATTACHMENT 6.

7. COMMENTS/SUGGESTIONS

Because Spectrum Engineering was providing construction management services for two AMRB projects in the same general area, our construction inspector split his time between the two construction sites. This unusual circumstance provided a reasonable degree of inspection at a reduced cost. However, construction management costs were higher than normal because a thorough review of truck weights was ordered and because the installed grade on the storm drain was surveyed. Additional costs were also incurred for drain pipe maintenance and evaluation of drainage problems.

8. PHOTOGRAPHS/SLIDES

8.1 Listing

A description of the photographs taken to document the work performed is found at the back of the final report under ATTACHMENT 7. The numbers on each picture correspond to the listing which precedes the photographs. The pictures are organized according to the following topics:

PICTURES	TOPIC
1-12	Contractor's Equipment
13-36	Storm Drain Installation
37	Pre-construction of Miners Coulee
38-80	Stabilization of Miners Coulee
81-89	Post-construction Views of Miners Coulee
90-92	Shaft Backfilling
93-141	Subsidence Backfilling
142-207	Crack Backfilling
208-210	Construction Road Reclamation
211-233	Pavement Repair

ATTACHMENT 1

BID TABULATION

ELSON COAL SITE RECLAMATION PROJECT
SAND COULEE, MONTANA

BID TABULATIONS				ENGINEER'S ESTIMATE		SHUMAKER TRUCKING & EXCAVATING			
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price				
1.	1	Lump	Mobilization		0.00	26,750.00	26,750.00		0
2.	5	KGAL	Provide Water		0.00	200.00	1,000.00		0
3.	1.4	Acre	Clearing and Grubbing		0.00	500.00	700.00		0
4.	7750	C.Y.	Exc. & Replacement of Material		0.00	3.75	29,062.50		0
5.	3250	Ton	Provide and Place Lime Rock-Type I		0.00	32.00	104,000.00		0
	225	Ton	Type II		0.00	32.00	7,200.00		0
6.	1620	S.Y.	Bank Stabilization Fabric		0.00	2.00	3,240.00		0
7.	100	CY	Rock Excavation		0.00	15.00	1,500.00		0
8.	300	Ton	Imported Fill		0.00	8.00	2,400.00		0
9.	1950	CY	Imported Cover Soil		0.00	7.00	13,650.00		0
10.	541	CY	Backfill Type 1 Cracks		0.00	15.00	8,115.00		0
11.	765	CY	Backfill Type 2 Cracks		0.00	15.00	11,475.00		0
12.	934	CY	Backfill Subsidences		0.00	9.00	8,406.00		0
13.	80	CY	Backfill Shaft		0.00	25.00	2,000.00		0
14.	370	LF	Remove & Disp. Exi. 12" storm drain		0.00	2.00	740.00		0
15.	553	LF	Provide and install new 15" RCP		0.00	30.00	16,590.00		0
16.	2	Each	Storm Drain Manhole		0.00	2,000.00	4,000.00		0
17.	1	LS	Water Main Deflection		0.00	250.00	250.00		0
18.	1156	SY	Gravel Road Reconstruction		0.00	7.00	8,092.00		0
19.	16	SY	Asphalt pavement Replacement		0.00	50.00	800.00		0
20.	1.8	Acre	Fertilize, Seed and Mulch		0.00	1,500.00	2,700.00		0
21.	90	Each	Plantings		0.00	20.00	1,800.00		0
22.	1250	L.Ft.	Fencing		0.00	2.50	3,125.00		0
23.	290	Bales	Straw Bales		0.00	10.00	2,900.00		0
24.	850	L.Ft.	Silt Fence		0.00	2.00	1,700.00		0
25.	120	CY	6" und. of 1½" cr. base gravel asphalt		0.00	15.00	1,800.00		0
26.	40	CY	2" thick asphalt		0.00	135.00	5,400.00		0
			Total		0.00		269,395.50		0

Engineer's Estimate
September 2, 1994

SECTION II

2.1 PROPOSAL (cont.)

Item No.	Estimated Quantity	Unit	Description	Unit Price	Total Price
1.	1	LUMP SUM	MOBILIZATION	XXXX	$ 22,000.00
2.	5	KGAL	PROVIDE WATER	75.00	$ 375.00
3.	1.4	ACRE	CLEARING AND GRUBBING	4,000.00	$ 5,600.00
4.	7750	CUBIC YARD	EXCAVATION AND REPLACEMENT OF MATERIAL FROM COULEE	3.00	$ 23,250.00
5.			PROVIDE AND PLACE LIME ROCK:		
	3250	TON	TYPE I	30.00	$ 97,500.00
	225	TON	TYPE II	30.00	$ 6,750.00
6.	1620	SQUARE YD	BANK STABILIZATION FABRIC	3.00	$ 4,860.00
7.	100	CUBIC YARD	ROCK EXCAVATION	3.20	$,320.00
8 .	300	TON	IMPORTED FILL	4.80	$ 1,440.00
9.	1950	CUBIC YARD	IMPORTED COVER SOIL	5.00	$ 9,750.00
10.	541	CUBIC YARD	BACKFILL TYPE 1 CRACKS	18.00	$ 9,738.00
11.	765	CUBIC YARD	BACKFILL TYPE 2 CRACKS	15.00	$ 11,475.00
12.	934	CUBIC YARD	BACKFILL SUBSIDENCES	7.00	$ 6,538.00
13.	80	CUBIC YARD	BACKFILL SHAFT	10.00	$,800.00
14.	370	LINEAR FT	REMOVE AND DISPOSE OF EXISTING 12" STORM DRAIN	3.00	$ 1,110.00
15.	553	LINEAR FT	PROVIDE AND INSTALL NEW 15" RCP	12.00	$ 6,636.00
16.	2	EACH	STORM DRAIN MANHOLE	1000.00	$ 2,000.00
17.	1	LUMP SUM	WATER MAIN DEFLECTION	XXXX	$ 4,000.00
18.	1156	SQUARE YD	GRAVEL ROAD RECONSTRUCTION	2.50	$ 2,895.00
19.	16	SQUARE YD	ASPHALT PAVEMENT REPLACEMENT	50.00	$,800.00

Firm
Name: ____________________

SECTION II

2.1 PROPOSAL (cont.)

Item No.	Estimated Quantity	Unit	Description	Unit Price	Total Price
20.	1.8	ACRE	FERTILIZE, SEED & MULCH	1,500.00	$ 2,700.00
21.	90	EACH	PLANTINGS	50.00	$ 4,500.00
22.	1250	LINEAR FT	FENCING	2.15	$ 2,687.50
23.	290	BALES	STRAW BALES	10.00	$ 2,900.00
24.	850	LINEAR FT	SILT FENCE	1.50	$ 1,275.00
25.	120	CUBIC YARD	6" UNDERLAYMENT OF 1½" CRUSHED BASE COURSE GRAVEL FOR ASPHALT	15.00	$ 1,800.00
26.	40	CUBIC YARD	2" THICK ASPHALT	211.00	$ 8,440.00

TOTAL $ 242,139.50

Two Hundred Fourty Two Thousand, One Hundred Thirty NineDollars and Fifty Cents
(Price in Words)

Firm
Name: ____________________

ATTACHMENT 2

CHANGE ORDERS

CHANGE ORDER

ORDER NO. 1

PROJECT TITLE: Nelson Coal Site Reclamation Project

MONT A/E or DSL-AMRB: 93-013

CONTRACT DATE: November 1, 1994

OWNER: Department of State Lands, Abandoned Mine Reclamation Bureau

CONTRACTOR: Shumaker Trucking and Excavating

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
none	Water Main Break Repair Away From Project Site					940.00	940.00
	TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.						940.00
	OVERHEAD & PROFIT @ ____%						INC.
	GRAND TOTAL - THIS CHANGE ORDER						$940.00

Original Contract Price	$ 269,395.50
Current Contract Price Adjusted by Previous Change Order	$ 269,395.50
Cost this Change Order (+ or -)	+ $ 940.00
New Contract Price including this Change Order	$ 270,335.50

The completion date as set forth in the Contract Documents shall be (unchanged, increased, decreased) by 11 calendar days.

1 day granted for water main break repair
10 days granted for weather days (Nov. 16, 17, 18, 19, 20, 24, 25, 26, 27, 30, 1994)

The date for completion of all work will be 12/11/1994 plus any winter shut-down days.

Description and Justification for Change:

During the work for the deflection of the existing Sand Coulee water main under the new storm drain, a water break occurred away from the project site. The reason for this break is due to the poor condition of the Sand Coulee water system. This break is in no way attributable to the Contractor.

The costs for this task include:

Plumber	$38.50 hr x 2 hr =	$ 77.00
(2) Dresser Coupler	$53.00 ea x 2 =	$106.00
1 Length of Pipe		$ 45.00
CAT 436 Backhoe	$100.00/hr x 2 hr =	$200.00
CAT 416 Backhoe	$85.00/hr x 1½ hr =	$127.50
Laborer	$31.00/hr x 9½ hr =	$294.50
Superintendent	$45.00/hr x 2 hr =	$ 90.00
		$940.00

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by $_________ (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by $_________ (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT	SURETY
COGSWELL AGENCY	VIGILANT INSURANCE COMPANY
BY:	By: Seal

Recommended by: Spectrum Engineering Engineer 12/1/94 Date

Accepted by: Shumaker Trucking and Excavating Contractor 12/5/94 Date

Approved by: Owner Date

RECEIVED
APR - 6 1995
STATE LANDS

CHANGE ORDER

ORDER NO. 2

PROJECT TITLE: Nelson Coal Site Reclamation Project

MONT A/E or DSL-AMRB: 93-013

CONTRACT DATE: November 1, 1994

OWNER: Department of State Lands, Abandoned Mine Reclamation Bureau

CONTRACTOR: Shumaker Trucking and Excavating

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
extra	Regrading drainage ditch away from the project site					$502.00	$502.00
2	Provide Water (5KGal less @ $200/KGal)					$-1,000.00	$-1,000.00
5	Lime Rock (1.09 tons more @ $32/ton)					$34.88	$34.88
10	Backfill material (132 CY less @ $15/CY)					$-1,980.00	$-1,980.00
1[illegible]	Backfill material (356 CY less @ $15/CY)					$-5,340.00	$-5,340.00
12	Backfill subsidence (106 CY more @ $9/CY)					$954.00	$954.00
1[illegible]	15" RCP (8 ft more @ $30/ft)					$240.00	$240.00
20	Fertilize, Seed and Mulch (0.83 ac more @ $1500/acre)					$1,245.00	$1,245.00
22	Fencing (138 ft @ $2.50/ft)					$345.00	$345.00
23	Straw bales (56 bales less @ $10/bale)					$-560.00	$-560.00
24	Silt Fence (850 LF less @ $2.00/LF)					$-1,700.00	$-1,700.00
	TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.						
	OVERHEAD & PROFIT @ _____%						INC.
	GRAND TOTAL - THIS CHANGE ORDER						$-7,259.12

Original Contract Price	$ 269,395.50
Current Contract Price Adjusted by Previous Change Order	$ 270,335.50
Cost this Change Order (+ or -)	- $ 7,259.12
New Contract Price including this Change Order	$ 263,076.38

The completion date as set forth in the Contract Documents shall be ([✓ unchanged], increased, decreased) by 0 calendar days.

The date for completion of all work will be 3/25/1995 plus any shut-down days. The project is currently shut down until weather conditions allow the placing of asphalt.

Description and Justification for Change:

Extra Project

A land owner near the Nelson project site contacted MTDSL concerning a water problem he was having with a drainage ditch adjacent to his property that he though was related to this reclamation. Spectrum Engineering consulted with this land owner and Dan Koszuta from MTDSL about his drainage ditch which had silted in. MTDSL decided that while this ditch was not directly affected by the Nelson reclamation project, it was in the best interest of all of the projects within this area to regrade this ditch. As such it is included with this change order.

The costs for this task include:

CAT 436 Backhoe	$100.00 hr x 2 hr =	$ 200.00
Tandem	$75.00 hr x 2 hr =	$150.00
Laborer	$31.00/hr x 2 hr =	$62.00
Superintendent	$45.00/hr x 2 hr =	$ 90.00
		$502.00

Quantity Adjustment

The work items for this project are completed except for the asphalt patch on Dahns Lane and the asphalt overlay on Miners Lane. As such, the quantities for the remainder of the work items (excluding the 6" of base coarse for Miners Lane pending a final decision by MTDSL) are adjusted as part of this change order. The work items and the quantities increased/decreased are shown on page CO-1 of this change order.

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by $ -7259.12 (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by $ -7259.12 (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT

Lorrin A. Darby, Resident Agent

By:

SURETY

Vigilant Insurance Company

By:

Lorrin A. Darby, Seal Attorney-In-Fact

Recommended by: Spectrum Engineering 3/28/95

Engineer Date

Accepted by: Shumaker Trucking and Excavating 4/5/95

Contractor Date

Approved by: J Koerth 4/6/95 4/7/95

Owner Date

CHANGE ORDER

ORDER NO. 3

PROJECT TITLE: Nelson Coal Site Reclamation Project

MONT A/E or DSL-AMRB: 93-013

CONTRACT DATE: November 1, 1994

OWNER: Department of State Lands, Abandoned Mine Reclamation Bureau

CONTRACTOR: Shumaker Trucking and Excavating

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
extra	Milling of 2" asphalt overlayment and culvert area preparation (per work Directive #1)					$1,591.00	$1,591.00
6	An additional 99 square yards of fabric were required to complete the ditch (99 SY @ $2/SY)					$198.00	$198.00
19	Delete the Asphalt Pavement Replacement over the ditch area at -16 SY @ $50/SY (replaced by the overlayment)					$-800.00	$-800.00
25	Delete the 6" gravel underlayment at -120 CY @ $15/CY (replaced by the overlayment)					$-1,800.00	$-1,800.00
26	Increase the area covered to include the culvert area and the area broken up adjacent to the culvert exit (16.6 CY more @ $135/CY)					$2,241.00	$2,241.00

TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC. $1,430.00

OVERHEAD & PROFIT @ ____% INC.

GRAND TOTAL - THIS CHANGE ORDER $1,430.00

Original Contract Price	$ 269,395.50
Current Contract Price Adjusted by Previous Change Order	$ 270,335.50
Cost this Change Order (+ or -)	$ 1,430.00
New Contract Price including this Change Order	$ 264,506.38

The completion date as set forth in the Contract Documents shall be ([✓ unchanged], increased, decreased) by 0 calendar days.

The date for completion of all work was 4/26/1995.

Description and Justification for Change:

This change order adjusts the final quantities and follows Work Directive #1 issued 4/18/1995 which modified digging up the street to providing a 2" asphalt overlayment. A full description of justification is found in Word Directive #1. The following bid items were affected by the work directive.

Item	Quantity	Unit	Description	Price/ Unit	Bid Price	Modifications
Culvert Area						
19	16	Sq Yd	Asphalt Pavement Replacement	50/sq yd	$800	$0.00
Miners Lane						
25	120	Cu Yd	6" gravel base	15/cu yd	$1,800	$0.00
Miners Lane & Culvert Area						
26 (new)	16.6	Cu Yd	2" thick asphalt overlayment (16.6 CY extra needed)	135/cu yd		$2,241.00
New Items	1	Lump Sum	Milling of 2" overlayment	$1,250/ls		$1,441.00
	1	Lump Sum	Culvert Area Preparation	$150/ls		$150.00

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by $ 1,430.00 (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by $ 1,430.00 (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA
RESIDENT AGENT

By: Lorrin A. Darby, Resident Agent

SURETY

Vigilant Insurance Company

By:
Lorrin A. Darby Seal Attorney-In-Fact

Recommended by: Spectrum Engineering 5/3/95
Engineer Date

Accepted by: Shumaker Trucking and Excavating 5/4/95
Contractor Date

Approved by: 5/8/95
Owner Date

WORK DIRECTIVE CHANGE

(Instructions on Reverse Side) No. 1

PROJECT: Nelson Coal Site Reclamation Project

CONTRACTOR: (Name, Address) Shumaker Trucking and Excavating
P.O. Box 1442
Great Falls, MT
59403

DATE OF ISSUANCE: 4/17/1995

OWNER: Montana Department of State Lands

MONT A/E or DSL-AMRB: 93-013

CONTRACT FOR:

ENGINEER: Spectrum Engineering

You are directed to proceed promptly with the following change(s):

Description and Purpose: Gary Cook, Cascade County Road Foreman and Spectrum Engineering feel that a 2" overlay of asphalt over the existing road surface will be better than replacement of the existing 6" gravel base and 2" of new asphalt. This work directive authorizes Shumaker Trucking to substitute the overlayment for bid items 19, 25 and 26. The bid price for item 19 ($800), item 25 ($1,800) and item 26 ($5,400) will be affected. The net contract price changes and justifications are shown on the attached sheet. The asphalt pavement replacement should be 26 sq yards (5 cubic yards) which will be done under bid item 26. Cutting out the existing patch over the culvert and milling it in is also included under item 26.

Attachments: (list documents supporting change)

If a claim is made that the above change(s) have affected Contract Price or Contract Time, any claim for a Change Order based thereon will involve one of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:

☐ Time and Materials
☐ Unit Prices
☐ Cost Plus Fixed Fee
☒ Other Negotiated Lump Sum

Estimated decrease in Contract Price: $-334.00. If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Method of determining change in Contract Time:

☐ Contractor's Records
☒ Engineer's Records
☐ Other ________

Estimated increase in Contract Time: two (2) days. If the change involves an increase, the estimated time is not to be exceeded without further authorization.

RECOMMENDED: Spectrum Engineering

By: William C Maehl
Engineer

ACCEPTED: Shumaker Trucking & Excavating

By: 4/19/95
Contractor

AUTHORIZED: MT Department of State Lands - AMRB

By John Koerth 4/24/95
Owner

WORK DIRECTIVE CHANGE

INSTRUCTIONS

A. GENERAL INFORMATION

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Time. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a change in the Contract Price or the Contract Time, a Field Order may be issued.

B. COMPLETING THE WORK DIRECTIVE CHANGE

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

> METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE: Mark the method to be used in determining the final cost of Work involved and the net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed work is completed, another Work Directive Change must be issued to change the time or Contractor may stop the changed Work when the estimated time is reached. If the Work Directive Change is not likely to change the Contract Price, the space for estimated increase (decreased) should be marked "Not Applicable".
>
> METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIME: Mark the method to be used in determining the change in Contract Time and the estimated increase or decrease in Contract Time. If the change involves and increase in the Contract Time and the estimated time is approached before additional or changed Work is completed, another Work Directive Change must be issued to change the time or Contractor may stop the changed Work when the estimated time is reached. If the Work Directive Change is not likely to change the Contract Time, the space for estimated increase (decrease) should be marked "Not Applicable".

Once Engineer has completed and signed the form, all copies should be sent to Owner for authorization because Engineer alone does not have authority to authorize changes in Price or time. Once authorized by Owner, a copy should be sent by Engineer to Contractor.

Once the Work covered by this directive is completed for final cost and time determined, Contractor should submit documentation for inclusion in a Change Order.

THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIME. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.

WORK DIRECTIVE CHANGE 1
NELSON COAL SITE RECLAMATION PROJECT
APRIL 18, 1995

The work modification to a 2" overlayment of asphalt with milling on the edges changes the following three bid items.

Item	Estimated Quantity	Unit	Description	Price/ Unit	Bid Price	Work Directive Modifications
Culvert Area						
19	16	Sq Yd	Asphalt Pavement Replacement	50/sq yd	$800	$0.00[1]
Miners Lane						
25	120	Cu Yd	6" gravel base	15/cu yd	$1,800	$0.00[2]
26	40	Cu Yd	2" thick asphalt	135/cu yd	$5,400	
Miners Lane & Culvert Area						
26 (new)	45[3]	Cu Yd	2" thick asphalt overlayment	135/cu yd		$6,075.00
New Items	1	Lump Sum	Milling of 2" overlayment[4]	$1,250/ls		$1,250.00
	1	Lump Sum	Milling of 2" overlayment[5]	$191/ls		$191.00
	1	Lump Sum	Culvert Area Preparation[6]	$150/ls		$150.00
Net Change (net project decrease of $334)					$8,000	$7,666.00

1 This step (bid item 19) is not necessary and will be done as part of the 2" overlayment.

2 This step (bid item 25) is no longer required.

3 The additional 5 cubic yards of asphalt will be used as overlayment where the culvert was replaced.

4 This new item (milling) is necessary to assure a long-lasting solution (as opposed to feathering it in which is subject to breakup). The milling is planned against the main county road (18 feet), along the post office parking lot (110 feet) and on the south side of Dahn's lane (23 feet) where it intersects with Miner's Lane.

5 The milling cost for fixing the asphalt over the replaced culvert was originally included in the price to fix the asphalt patch (item 19). With the elimination of bid item 19, the milling cost needs to be broken out separately. The first milling bid was $1,250 for 151+ feet of milling. The milling for the culvert replacement area was bid at the same rate/foot for the 23 feet or $191.

6 The current patch of gravel and asphalt where the culvert is under Dahn's Lane needs to be dug up and replaced (currently at grade). The motor grader and cleanup time costs are $150.

ATTACHMENT 3

PAYMENT REQUESTS

RECEIVED
DEC 06 1994
STATE LANDS

PAYMENT REQUEST NO. 1

FROM 11/01/199~~3~~4 TO 12/01/1994

PROJECT TITLE: NELSON COAL SITE RECLAMATION PROJECT

LOCATION: CASCADE COUNTY MONT A/E or DSL-AMRB: 93-013

NAME OF CONTRACTOR: SHUMAKER TRUCKING AND EXCAVATING

ADDRESS: P.O. BOX 1442, GREAT FALLS, MT 59403

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ 269,395.50
Change Order No. 1	$ 940.00	
Change Order No.	$	
Change Order No.	$	
Amount of Approved Change Order(s)		$ 940.00
TOTAL CONTRACT AMOUNT		$ 270,335.50

Pay Request No.	Amount of Request
1	$ 173,475.96

Total Contract Amount Completed to Date	$ 173,475.96
Less Retainage (10 %)	$ 17,347.60
TOTAL AMOUNT EARNED TO DATE	$ 156,128.36
Less Previous Payments	$ 0.00
AMOUNT DUE THIS PAYMENT	$ 156,128.36
Less 1% Tax	$ 1,561.28
TOTAL DUE CONTRACTOR	$ 154,567.08

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

SHUMAKER TRUCKING AND EXCAVATING
Contractor
By
Date 12/5/94

RECOMMENDED BY:

SPECTRUM ENGINEERING
Engineer
By Vern
Date 12/1/94

APPROVED BY:

DEPARTMENT OF STATE LANDS, ABANDONED MINE RECLAMATION BUREAU
Owner
By Vic R Andersen
Date

RESP. CNTR. 30144 95-0005-01
OBJ. EXP. 2121
APPROVAL Vic R Andersen
DATE 12-6-94

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
1.	Mobilization	1 LS	26750.00	0	0.5	0.5	13,375.00	13,375.00
2.	Provide Water	5 Kgal	200.00	0	0	0	0.00	0.00
3.	Clearing and Grubbing	1.4 Ac	500.00	0	1.0	1	[illegible]0.00	500.00
4.	Excavation and Replacement of Material From Coulee	7750 CY	3.75	0	3000	3000	11,250.00	11,250.00
5.	Provide and Place Lime Rock Type I Type II	3250 T 225 T	32.00 32.00	0	2800	2800	89,608.96	89,608.96
6.	Bank Stabilization Fabric	1620 SY	2.00	0	1400	1400	2,800.00	2,800.00
7.	Rock Excavation	100 CY	15.00	0	100	100	1,500.00	1,500.00
8.	Imported Fill	300 Ton	8.00	0	0	0	0.00	0.00
9.	Imported Cover Soil	1950 CY	7.00	0	0	0	0.00	0.00
10.	Backfill Type I Cracks	541 CY	15.00	0	409	409	6,135.00	6,135.00
11.	Backfill Type II Cracks	765 CY	15.00	0	409	409	6,135.00	6,135.00
12.	Backfill Subsidences	934 CY	9.00	0	1040	1040	9,360.00	9,360.00
13.	Backfill Shaft	80 CY	25.00	0	0	0	0.00	0.00
14.	Remove and Dispose of Existing 12" Storm Drain	370 LF	2.00	0	370	370	740.00	740.00
15.	Provide and Install New 15" RCP	553 LF	30.00	0	561	561	16,830.00	16,830.00
16.	Storm Drain Manhole	2 EA	2000.00	0	[illegible]	[illegible]	4,000.00	4,000.00
17.	Water Main Deflection	1 LS	250.00	0	1	1	250.00	250.00
18.	Gravel Road Reconstruction	1156 SY	7.00	0	1156	1156	8,092.00	8,092.00
19.	Asphalt Pavement Replacement	16 SY	50.00	0	0	0	0.00	0.00
20.	Fertilize, Seed and Mulch	1.8 Ac	1500.00	0	0.5	0.5	750.00	750.00
21.	Plantings	90 EA	20.00	0	0	0	0.00	0.00

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
22.	Fencing	1250 LF	2.50	0	860	860	2,150.00	2,150.00
23.	Straw Bales	290 EA	10.00	0	0	0	0.00	0.00
24.	Silt Fence	850 LF	2.00	0	0	0	0.00	0.00
25.	6" Underlayment of 1½" Crushed Base Course for Asphalt	120 CY	15.00	0	0	0	0.00	0.00
26.	2" Thick Asphalt	40 CY	135.00	0	0	0	0.00	0.00
	Materials on Site (Attach Schedule)	--	--	$	$	--	$0.00	$0.00
	TOTALS						$173,475.96	$173,475.96

PAYMENT REQUEST NO. 2

FROM 12/01/1994 TO 12/09/1994

PROJECT TITLE: NELSON COAL SITE RECLAMATION PROJECT

LOCATION: CASCADE COUNTY MONT A/E or DSL-AMRB: 93-013

NAME OF CONTRACTOR: SHUMAKER TRUCKING AND EXCAVATING

ADDRESS: P.O. BOX 1442, GREAT FALLS, MT 59403

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ 269,395.50
Change Order No. 1	$ 940.00	
Change Order No. ____	$	
Change Order No. ____	$	
Amount of Approved Change Order(s)		$ 940.00
TOTAL CONTRACT AMOUNT		$ 270,335.50

Pay Request No.	Amount of Request
1	$ 156,128.36
2	$ 66,193.69

Total Contract Amount Completed to Date	$ 247,024.50
Less Retainage (10 %)	$ 24,702.45
TOTAL AMOUNT EARNED TO DATE	$ 222,322.05
Less Previous Payments	$ 156,128.36
AMOUNT DUE THIS PAYMENT	$ 66,193.69
Less 1% Tax	$ 661.94
TOTAL DUE CONTRACTOR	$ 65,531.75

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

SHUMAKER TRUCKING AND EXCAVATING
Contractor

By

Date 1/9/95

RECOMMENDED BY:

SPECTRUM ENGINEERING
Engineer

By

Date 1/6/95

APPROVED BY:

DEPARTMENT OF STATE LANDS, ABANDONED
MINE RECLAMATION BUREAU
Owner

By

Date OK DMK

RESP. CNTR. 30144 95006-01
OBJ. EXP. 2121
APPROVAL Vic R Andersen
DATE 1-10-95

Rev. 3/91

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
1.	Mobilization	1 LS	26750.00	0.5	0.5	1	26,750.00	13,375.00
2.	Provide Water	5 Kgal	200.00	0	0	0	0.00	0.00
3.	Clearing and Grubbing	1.4 Ac	500.00	1	0.4	[illegible].4	700.00	200.00
4.	Excavation and Replacement of Material From Coulee	7750 CY	3.75	3000	4750	7750	29,062.50	17,812.50
5.	Provide and Place Lime Rock Type I Type II	3250 T 225 T	32	2800	600	3400	108,800.00	19,200.00
6.	Bank Stabilization Fabric	1620 SY	2.00	1400	220	1620	3,240.00	440.00
1.	Rock Excavation	100 CY	15.00	100	0	100	1,500.00	0.00
8.	Imported Fill	300 Ton	8.00	0	300	300	2,400.00	2,400.00
3.	Imported Cover Soil	1950 CY	7.00	0	1950	1950	13,650.00	13,650.00
12.	Backfill Type I Cracks	541 CY	15.00	409	0	409	6,135.00	0.00
11.	Backfill Type II Cracks	765 CY	15.00	409	0	409	6,135.00	0.00
12.	Backfill Subsidences	934 CY	9.00	1040	0	1040	9,360.00	0.00
13.	Backfill Shaft	80 CY	25.00	0	0	0	0.00	0.00
14.	Remove and Dispose of Existing 12" Storm Drain	370 LF	2.00	370	0	370	740.00	0.00
15.	Provide and Install New 15" RCP	553 LF	30.00	561	0	561	16,830.00	0.00
16.	Storm Drain Manhole	2 EA	2000.00	2	0	2	4,000.00	0.00
17.	Water Main Deflection	1 LS	250.00	1	0	1	250.00	0.00
18.	Gravel Road Reconstruction	1156 SY	7.00	1156	0	1156	8,092.00	0.00
19.	Asphalt Pavement Replacement	16 SY	50.00	0	0	0	0.00	0.00
20.	Fertilize, Seed and Mulch	1.8 Ac	1500.00	0.5	1.08	1.58	2,370.00	1,620.00

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
21	Plantings	90 EA	20	0	75	75	1,500.00	1,500.00
22.	Fencing	1250 LF	2.00	860	528	1388	3,470.00	1,320.00
23.	Straw Bales	290 EA	10.00	0	204	204	2,040.00	2,040.00
24.	Silt Fence	850 LF	2.00	0	0	0	0.00	0.00
25.	6" Underlayment of 1½" Crushed Base Course for Asphalt	120 CY	15.00	0	0	0	0.00	0.00
26.	2" Thick Asphalt	40 CY	135.00	0	0	0	0.00	0.00
	Materials on Site (Attach Schedule)	--	--	$	$	--	$0.00	$0.00
	Correction From Payment Request #1						0.00	(8.96)
	TOTALS						$247,024.50	$73,548.54

RECEIVED
APR - 6 1995
STATE LANDS

PAYMENT REQUEST NO. 3

FROM 12/10/1994 TO 3/22/1995

PROJECT TITLE: NELSON COAL SITE RECLAMATION PROJECT

LOCATION: CASCADE COUNTY MONT A/E or DSL-AMRB: 93-013

NAME OF CONTRACTOR: SHUMAKER TRUCKING AND EXCAVATING

ADDRESS: P.O. BOX 1442, GREAT FALLS, MT 59403

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ 269,395.50
Change Order No. 1	$ 940.00	
Change Order No. 2	$ -7,259.12	
Change Order No.	$	
Amount of Approved Change Order(s)		$ -6,319.12
TOTAL CONTRACT AMOUNT		$ 263,076.38

Pay Request No.	Amount of Request
3	$ 156,128.36
2	$ 66,193.69
3	$ 7,246.69

Total Contract Amount Completed to Date	$ 255,076.38
Less Retainage (10 %)	$ 25,507.64
TOTAL AMOUNT EARNED TO DATE	$ 229,568.74
Less Previous Payments	$ 222,322.05
AMOUNT DUE THIS PAYMENT	$ 7,246.69
Less 1% Tax	$ 72.47
TOTAL DUE CONTRACTOR	$ 7,174.22

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

SHUMAKER TRUCKING AND EXCAVATING
Contractor

By

Date 4/5/95

RECOMMENDED BY:

SPECTRUM ENGINEERING
Engineer

By

Date 4/4/95

APPROVED BY:

DEPARTMENT OF STATE LANDS, ABANDONED MINE RECLAMATION BUREAU
Owner

By JKoutt 4/6/95

Date

RESP. CNTR. 30144 222-95-02C 5-01
OBJ. EXP. 4141
APPROVAL
DATE 4-7-95

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
1.	Mobilization	1 LS	26750.00	●	0	●	26,750.00	0.00
2.	Provide Water	5 Kgal	200.00	0	0	0	0.00	0.00
9.	Clearing and Grubbing	1.4 Ac	500.00	1.4	0	1.4	700.00	0.00
4.	Excavation and Replacement of Material From Coulee	7750 CY	3.75	7750	0	7750	29,062.50	0.00
5.	Provide and Place Lime Rock Type I Type II	3250 T 225 T	32	3400	76.09	3476.09	111,234.88	2,434.88
6.	Bank Stabilization Fabric	1620 SY	2.00	1620	0	1620	3,240.00	0.00
7.	Rock Excavation	100 CY	15.00	100	0	100	1,500.00	0.00
8.	Imported Fill	300 Ton	8.00	300	0	300	2,000.00	0.00
9.	Imported Cover Soil	1950 CY	7.00	1950	0	1950	13,650.00	0.00
10.	Backfill Type I Cracks	541 CY	15.00	409	0	409	6,135.00	0.00
11.	Backfill Type II Cracks	765 CY	15.00	409	0	409	6,135.00	0.00
12.	Backfill Subsidences	934 CY	9.00	1040	0	1040	9,360.00	0.00
13.	Backfill Shaft	80 CY	25.00	0	100	100	2,000.00	2,000.00
14.	Remove and Dispose of Existing 12" Storm Drain	370 LF	2.00	370	0	370	740.00	0.00
15.	Provide and Install New 15" RCP	553 LF	30.00	561	0	561	16,830.00	0.00
16.	Storm Drain Manhole	2 EA	2000.00	2	0	2	4,000.00	0.00
17.	Water Main Deflection	1 LS	250.00	1	0	1	250.00	0.00
18.	Gravel Road Reconstruction	1156 SY	7.00	1156	0	1156	8,092.00	0.00
19.	Asphalt Pavement Replacement	16 SY	50.00	0	0	0	0.00	0.00
20.	Fertilize, Seed and Mulch	1.8 Ac	1500.00	1.58	1.05	2.63	3,945.00	1,575.00

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
21	Plantings	90 EA	20	75	15	90	1,800.00	300.00
22.	Fencing	1250 LF	2.50	1388	0	1388	3,470.00	0.00
23.	Straw Bales	290 EA	10.00	204	30	234	2,340.00	300.00
24.	Silt Fence	850 LF	2.00	75	0	0	0.00	0.00
25.	6" Underlayment of 1½" Crushed Base Course for Asphalt	120 CY	15.00	0	0	0	0.00	0.00
26.	2" Thick Asphalt	40 CY	135.00	0	0	0	0.00	0.00
	Materials on Site (Attach Schedule)	–	–	$	$	–	$0.00	$0.00
	Water Main Repair Away from Project Site (Change Order #1)	1 LS	940	0	1	1	940.00	940.00
	Regrading Ditch Away from project Site (Change Order #2)	1 LS	502	0	1	1	502.00	502.00
	TOTALS						$255,076.38	$8,051.88

PAYMENT REQUEST NO. 4

FROM 03/22/1995 TO 4/27/1995

PROJECT TITLE: NELSON COAL SITE RECLAMATION PROJECT

LOCATION: CASCADE COUNTY MONT A/E or DSL-AMRB: 93-013

NAME OF CONTRACTOR: SHUMAKER TRUCKING AND EXCAVATING

ADDRESS: P.O. BOX 1442, GREAT FALLS, MT 59403

SUMMARY OF PROJECT STATUS

Amount of Original Contract		$ 269,395.50
Change Order No. 1	$ 940.00	
Change Order No. 2	$ -7,259.12	
Change Order No. 3	$ 1,430.00	
Amount of Approved Change Order(s)		$ -4,889.12
TOTAL CONTRACT AMOUNT		$ 264,506.38

Pay Request No.	Amount of Request
1	$ 156,128.36
2	$ 66,193.69
3	$ 7,246.69
4	$ 34,937.64

Total Contract Amount Completed to Date	$ 264,506.38
Less Retainage (0 %)	$ 0.00
TOTAL AMOUNT EARNED TO DATE	$ 264,506.38
Less Previous Payments	$ 229,568.74
AMOUNT DUE THIS PAYMENT	$ 34,937.64
Less 1% Tax	$ 349.38
TOTAL DUE CONTRACTOR	$ 34,588.26

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

SHUMAKER TRUCKING AND EXCAVATING
Contractor

By

Date 5/4/95

RECOMMENDED BY:

SPECTRUM ENGINEERING
Engineer

By William C. Maehl

Date 5/3/95

APPROVED BY:

DEPARTMENT OF STATE LANDS, ABANDONED MINE RECLAMATION BUREAU
Owner

By John North

Date 5/5/95

RESP. CNTR. 30144 222-95005-01F
OBJ. EXP. 2121
APPROVAL Vic R Andersen
DATE 5-8-95

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
1.	Mobilization	1 LS	26750.00	●	0	1	26,750.00	0.00
2.	Provide Water	5 Kgal	200.00	0	0	0	0.00	0.00
3.	Clearing and Grubbing	1.4 Ac	500.00	1.4	0	1.4	700.00	0.00
4.	Excavation and Replacement of Material From Coulee	7750 CY	3.75	7750	0	7750	29,062.50	0.00
5.	Provide & Place Lime Rock Type I Type II	3250 T 225 T	32	3476.09	0	3476.09	111,234.88	0.00
6.	Bank Stabilization Fabric	1620 SY	2.00	1620	99	1719	3,438.00	198.00
7.	Rock Excavation	100 CY	15.00	100	0	100	1,500.00	0.00
8.	Imported Fill	300 Ton	8.00	300	0	300	2,400.00	0.00
9.	Imported Cover Soil	1950 CY	7.00	1950	0	1950	13,650.00	0.00
10.	Backfill Type I Cracks	541 CY	15.00	409	0	409	6,135.00	0.00
11.	Backfill Type II Cracks	765 CY	15.00	409	0	409	6,135.00	0.00
12.	Backfill Subsidences	934 CY	9.00	1040	0	1040	9,360.00	0.00
13.	Backfill Shaft	80 CY	25.00	80	0	80	2,000.00	0.00
14.	Remove/Dispose of Existing 12" Storm Drain	370 LF	2.00	370	0	370	740.00	0.00
15.	Provide and Install New 15" RCP	553 LF	30.00	561	0	561	16,830.00	0.00
16.	Storm Drain Manhole	2 EA	2000.00	2	0	2	4,000.00	0.00
17.	Water Main Deflection	1 LS	250.00	1	0	1	250.00	0.00
18.	Gravel Road Reconstruction	1156 SY	7.00	1156	0	1156	8,092.00	0.00
19.	Asphalt Pavement Replacement	16 SY	50.00	0	0	0	0.00	0.00

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed to Date	Total Contract Amount Completed to Date	Amount Due this Payment
20.	Fertilize, Seed and Mulch	1.8 Ac	1500.00	2.63	0	2.63	3,945.00	0.00
21.	Plantings	90 EA	20	90	0	90	1,800.00	0.00
22.	Fencing	1250 LF	2.50	1388	0	1388	3,470.00	0.00
23.	Straw Bales	290 EA	10.00	234	0	234	2,340.00	0.00
24.	Silt Fence	850 LF	2.00	0	0	0	0.00	0.00
25.	6" Underlayment of 1½" Crushed Base Course for Asphalt	120 CY	15.00	0	0	0	0.00	0.00
26.	2" Thick Asphalt	40 CY	135.00	0	56.6	56.6	7,641.00	7,641.00
	Materials on Site (Attach Schedule)	--	--	$	$	--	0.00	0.00
	Water Main Repair Away from Project Site (Change Order #1)	1 LS	940	1	0	1	940.00	0.00
	Regrading Ditch Away from Project Site (Change Order #2)	1 LS	502	1	0	1	502.00	0.00
	Milling of 2" Overlayment & Culvert Area Preparation (Change Order #3 & Work Directive #1)	1 LS	1,591	1	0	1	1,591.00	1,591.00
	TOTALS						$264,506.38	$9,430.00

ATTACHMENT 4

ANALYSIS OF CONSULTANT COSTS INCURRED

ANALYSIS OF CONSULTANT COSTS INCURRED
FOR THE MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
AMR PROJECT NUMBER: DSL-AMRB 93-013
NELSON COAL SITE RECLAMATION PROJECT

DATE OF PREPARATION: MAY 20TH, 1995

ENGINEERING SERVICE	AMOUNT
DESIGN (Thomas, Dean & Hoskins Inc.)	$34,249.14
BID PACKAGE PREPARATION AND PRE-BID	$ 6,459.77
TOTAL DESIGN ENGINEERING	$40,708.91
CONSTRUCTION INSPECTION:	$13,593.29
CONSTRUCTION ADMINISTRATION :	$15,059.86
TOTAL CONSTRUCTION ENGINEERING	$28,653.15
PROJECT ENGINEERING COST:	$69,362.06
CONSTRUCTION COST:	$264,506.38

PERCENTAGE ENGINEERING FEES TO CONSTRUCTION COST:

DESIGN ENGINEERING/CONSTRUCTION COST	15.39%
CONSTRUCTION ENGINEERING/CONSTRUCTION COST	10.83%
TOTAL ENGINEERING COST/CONSTRUCTION COST	26.22%

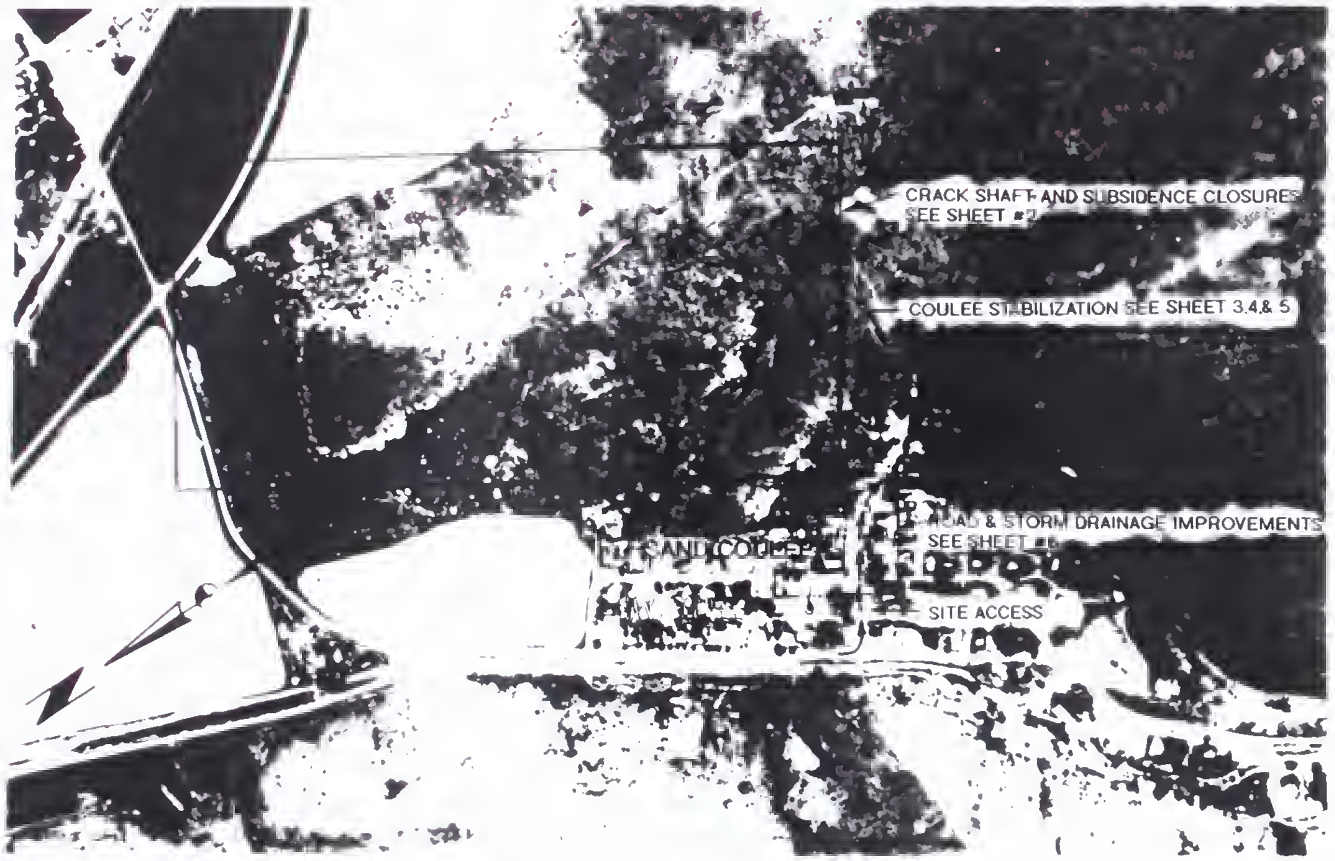
REMARKS: Services provided by Spectrum Engineering included surveying, bid document preparation, contract administration, quantity accounting, part time construction/reclamation inspection and final report preparation and project close-out.

ATTACHMENT 5

CONSTRUCTION BID PACKAGE DRAWINGS

MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU

NELSON COAL SITE RECLAMATION
PROJECT NO: DSL-AMRB NO. 93-013
JANUARY, 1994


CRACK SHAFT AND SUBSIDENCE CLOSURES
SEE SHEET #2
COULEE STABILIZATION SEE SHEET 3,4& 5
ROAD & STORM DRAINAGE IMPROVEMENTS
SEE SHEET #6
SAND COULEE
SITE ACCESS

LOCATION MAP

0 400' 800' 1200'

APPROX SCALE

MONTANA
ABANDONED MINE
RECLAMATION BUREAU

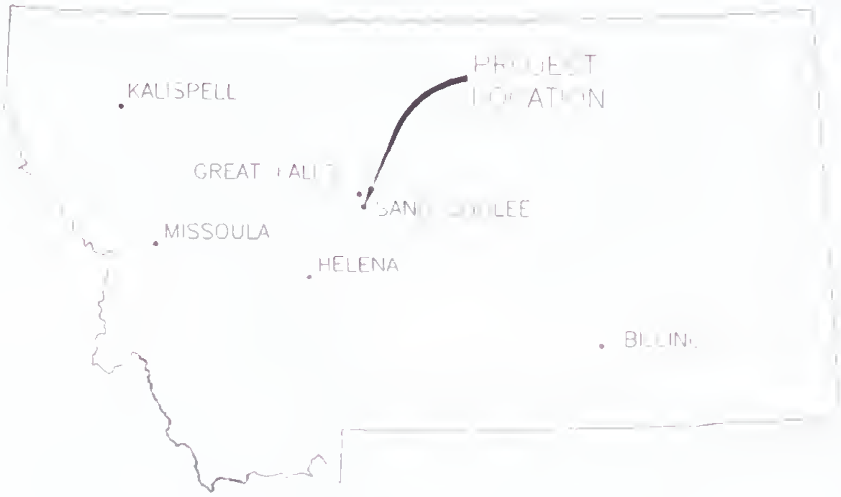


TABLE OF CONTENTS

PAGE	DESCRIPTION
1	COVER SHEET
2	CRACK, SHAFT AND SUBSIDENCE CLOSURES
3	COULEE STABILIZATION GRADING PLAN
4	COULEE STABILIZATION CROSS-SECTIONS
5	COULEE STABILIZATION PLANTING AND FENCING PLAN
6	STORM DRAIN PLAN AND PROFILE

CONTROL POINT INFORMATION

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	583 86	647 88	3601 45	5/8" REBAR
CP2	1015 39	647 88	3619 30	5/8" REBAR
CP4	942 99	210.63	3491 06	5/8" REBAR
CP5	988 22	-71 50	3472 82	5/8" REBAR

STAKE POINT INFORMATION

STAKE POINT	NORTHING	EASTING	STATION	DESCRIPTION
A	987.40	451.72	10+05	BASE LINE
B	947 40	794 36	13+50	BASE LINE
C	571.31	775 76	24+00	RIPRAP CHANNEL
D	600 43	747 67	23+60	RIPRAP CHANNEL
E	614 46	715.72	23+25	RIPRAP CHANNEL
F	613.76	672 19	22+82	RIPRAP CHANNEL
G	646.74	623 04	22+22	RIPRAP CHANNEL
H	679 02	585 48	21+72	RIPRAP CHANNEL
I	681 47	565 47	21+50	RIPRAP CHANNEL
J	698 31	522 28	21+03	RIPRAP CHANNEL
K	765.67	427 14	19+86	STORM DRAIN INLET
L	931 62	194 03	17+00	STORM DRAIN MH
M	967 05	-25 74	14+80	STORM DRAIN MH
N	1001.78	-59 09	14+32	STORM DRAIN OUTLET
O	1429 45	-0.11	10+00	END CULVERT

LEGEND

NEW	EXIST	DESCRIPTION
	— SD 12" —	STORM DRAIN
—SD 15"—		STORM DRAIN
—●—		STORM DRAIN MANHOLE
	— W 4" —	WATER LINE
	— — T — —	TELEPHONE CONDUIT
	— - - —	PROPERTY LINE
▨		LIME ROCK CORE CHANNEL
▨		ROCK SLOPE STEP TREATMENT AREA
▨		MAIN COULLEE FILL DISTURBED
	—•—•—	DITCH
—x—	—•—	FENCE
		HOLE
	▨	BUILDING
	⁘	SUBSIDENCE
		CRACK
	— 3680 —	MAJOR CONTOUR
	- - - -	MINOR CONTOUR
——		NEW CONTOUR
	▨	ROCK SLIDE AREA
——		BASELINE
	▨	ERODED AREA
——		CATCH LIMITS
		NEW ACCESS ROAD
	● TP#103	TEST PIT
▭		GRAVEL ROAD RESURFACING

ABBREVIATIONS

CPE	CORRUGATED POLYETHYLENE
F.L.	FLOW LINE
MIN	MINIMUM
EXIST, EX	EXISTING
', FT	FEET
", IN	INCHES
CMP	CORRUGATED METAL PIPE
GB	GRADE BREAK

GENERAL NOTES

1. AN ABANDONED COAL MINE UNDERLIES THIS SITE. MANY POTENTIAL HAZARDS EXIST. THE EXTENT OF THESE HAZARDS IS NOT FULLY KNOWN. CONTRACTOR AND OTHER PERSONS WORKING AT THE SITE SHALL APPRISE THEMSELVES OF THE CONDITIONS AND TAKE WHATEVER PRECAUTIONS ARE DEEMED NECESSARY TO INSURE SAFETY WHILE PREFORMING THEIR DUTIES
2. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN WRITING AND SHALL BE RESPONSIBLE FOR SECURING THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE BEGINNING EXCAVATION
3. ALL POWER, TELEPHONE AND OTHER UTILITY POLES OR GUY WIRES WHICH INTERFERE WITH THE CONSTRUCTION SHALL BE REMOVED OR RELOCATED BY THE UTILITY COMPANY
4. THE CONTRACTOR SHALL EXCAVATE ALL WATER AND UTILITY LINES PRIOR TO BEGINNING TRENCH EXCAVATION TO INSURE CROSSING CLEARANCE
5. ALL CULVERTS AND DRAINAGE DITCHES AFFECTED BY CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION, UNLESS OTHERWISE NOTED ON PLANS
6. AREAS DISTURBED BY CONSTRUCTION SHALL BE RESEEDED
7. MAINTAIN A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN OUTSIDE OF SEWER STORM DRAINS & WATER LINE CROSSINGS

MONTANA PROFESSIONAL ENGINEER
TIMOTHY P. RANF
NO 8742

DRAWN OTR DATE 1\94
DESIGNED TPR JOB NO 93-18
APPROVED DLZ F B NO 740

REVISIONS
BY DATE DESCR
BY DATE DESCR
BY DATE DESCR

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS-BOZEMAN-KALISPELL MONTANA
SPOKANE WASHINGTON

TD&H

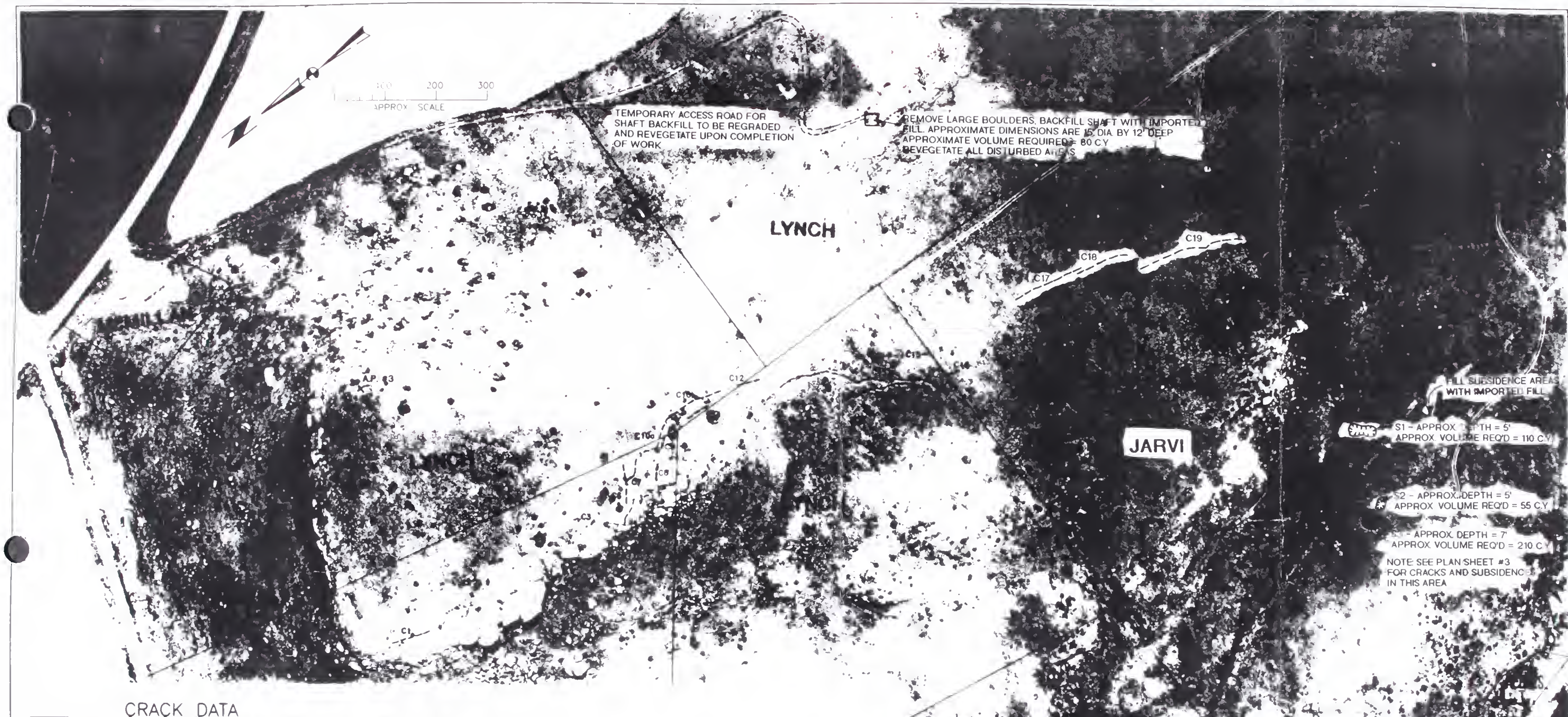
MONTANA DEPARTMENT OF STATE LAND-AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA
COVER SHEET

6 SHEETS

SHEET NO 1

9318-1.DW



TEMPORARY ACCESS ROAD FOR SHAFT BACKFILL TO BE REGRADED AND REVEGETATE UPON COMPLETION OF WORK

REMOVE LARGE BOULDERS, BACKFILL SHAFT WITH IMPORTED FILL. APPROXIMATE DIMENSIONS ARE 15' DIA. BY 12' DEEP
APPROXIMATE VOLUME REQUIRED = 80 C.Y.
REVEGETATE ALL DISTURBED AREAS

FILL SUBSIDENCE AREAS WITH IMPORTED FILL

S1 - APPROX. DEPTH = 5'
APPROX. VOLUME REQ'D = 110 C.Y.

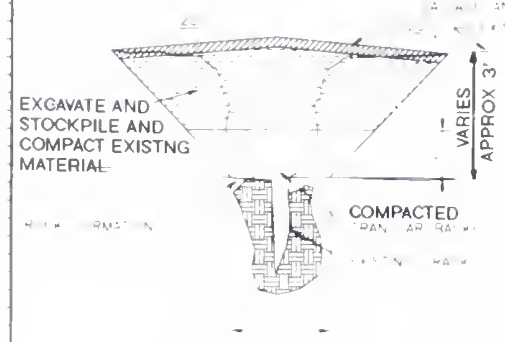
S2 - APPROX. DEPTH = 5'
APPROX. VOLUME REQ'D = 55 C.Y.

S3 - APPROX. DEPTH = 7'
APPROX. VOLUME REQ'D = 210 C.Y.

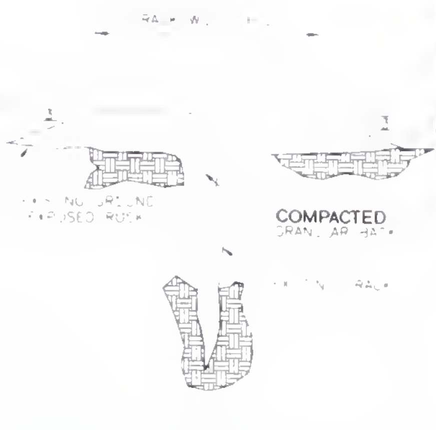
NOTE: SEE PLAN SHEET #3 FOR CRACKS AND SUBSIDENCES IN THIS AREA

CRACK DATA

CRACK	AVERAGE DIMENSIONS LENGTH (FT)	WIDTH (FT)	DEPTH (FT)	CLOSURE TYPE	APPROX. QUANTITY GRANULAR BACKFILL REQUIRED (C.Y.)
C1	65	1.5	12.0	1	89.0
C2	20	5.0	3.0	2	11.0
C3	21	0.3	4.0	1	14.0
C4	37	1.0	10.0	[illegible]	38.0
C5	21	0.8	4.0	[illegible]	16.0
C6	74	[illegible]	8.0	[illegible]	96.0
C7	54	3.0	4.5	[illegible]	71.0
C8	28	[illegible]	[illegible]	[illegible]	18.0
C9	9	[illegible]	4.0	[illegible]	19.0
C10a	[illegible]	2.5	[illegible]	[illegible]	180.0
C10b	105	7.0	5.0	[illegible]	140.0
C11	35	3.0	1.5	2	3.0
C12	55	3.0	1.0	2	8.0
C13	300	8.0	2.5	2	220.0
C14	129	3.5	1.5	2	30.0
C15	7	5.0	1.5	2	[illegible]
C16	14	0.8	1.7	2	[illegible]
C17	150	3.5	3.7	2	78.0
C18	85	3.8	3.0	2	39.0
C19	29	[illegible]	[illegible]	2	33.0
					96[illegible]


EXCAVATE AND STOCKPILE AND COMPACT EXISTNG MATERIAL
VARIES APPROX 3'
COMPACTED GRANULAR BACKFILL
EXISTING CRACK
ROCK FORMATION

TYPE 2 CRACK CLOSURE DETAIL



TYPE 1 CRACK CLOSURE DETAIL

MONTANA
TIMOTHY P. [illegible]
PROFESSIONAL ENGINEER

DRAWN JTR
DESIGN TPR
APPROVED
DATE 12/93
JOB NO. 93-18
FILE NO.

REVISIONS
BY DATE DESCR.

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS, BOZEMAN, KALISPELL, MONTANA
SPOKANE, WASHINGTON

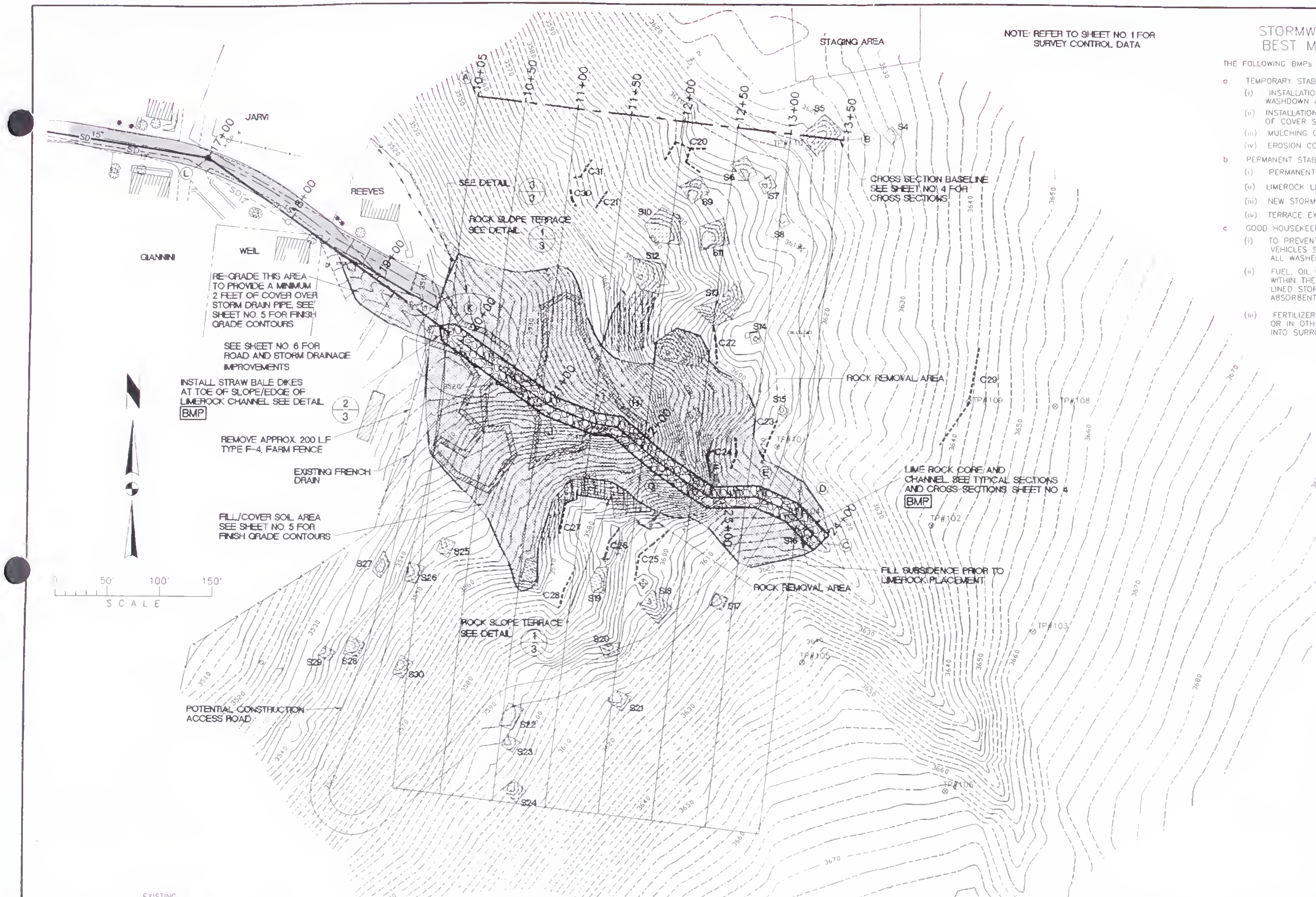
TD&H

MONTANA DEPARTMENT OF STATE LAND–AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA
CRACK, SHAFT AND SUBSIDENCE CLOSURES

6

2


NOTE: REFER TO SHEET NO. 1 FOR SURVEY CONTROL DATA
STAGING AREA
JARVI
REEVES
WEIL
GIANNINI
SEE DETAIL 3/3
ROCK SLOPE TERRACE SEE DETAIL 1/3
CROSS SECTION BASELINE SEE SHEET NO. 4 FOR CROSS SECTIONS
RE-GRADE THIS AREA TO PROVIDE A MINIMUM 2 FEET OF COVER OVER STORM DRAIN PIPE. SEE SHEET NO. 5 FOR FINISH GRADE CONTOURS
SEE SHEET NO. 6 FOR ROAD AND STORM DRAINAGE IMPROVEMENTS
INSTALL STRAW BALE DIKES AT TOE OF SLOPE/EDGE OF LIMEROCK CHANNEL SEE DETAIL 2/3 BMP
REMOVE APPROX. 200 LF TYPE F-4, FARM FENCE
EXISTING FRENCH DRAIN
FILL/COVER SOIL AREA SEE SHEET NO. 5 FOR FINISH GRADE CONTOURS
ROCK REMOVAL AREA
LIME ROCK CORE AND CHANNEL SEE TYPICAL SECTIONS AND CROSS-SECTIONS SHEET NO. 4 BMP
FILL SUBSIDENCE PRIOR TO LIMEROCK PLACEMENT
ROCK REMOVAL AREA
ROCK SLOPE TERRACE SEE DETAIL 1/3
POTENTIAL CONSTRUCTION ACCESS ROAD
0 50' 100' 150'
SCALE
10+05 10+50 11+00 11+50 12+00 12+50 13+00 13+50
17+00 18+00 19+00 20+00
S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27 S28 S29 S30
C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31
TP#102 TP#103 TP#105 TP#106 TP#107 TP#108 TP#109
3510 3520 3530 3540 3550 3560 3570 3580 3590 3600 3610 3620 3630 3640 3650 3660 3670 3680

STORMWATER EROSION CONTROL PLAN BEST MANAGEMENT PRACTICES (BMP)

THE FOLLOWING BMPs SHALL BE INSTALLED AND MAINTAINED THROUGHOUT CONSTRUCTION

a. TEMPORARY STABILIZATION
  - (i) INSTALLATION OF STRAW BALE DIKE AT TOE OF SLOPES AND ANY VEHICLE WASHDOWN AREAS AT ONSET OF CONSTRUCTION
  - (ii) INSTALLATION OF STRAW BALE DIKE OR SILT FENCE ON DOWNSLOPE PERIMETER OF COVER SOIL STOCKPILE
  - (iii) MULCHING OF ENTIRE DISTURBED AREA AFTER SEEDING AND FERTILIZING
  - (iv) EROSION CONTROL MAT ON 2:1 SLOPE AREAS

b. PERMANENT STABILIZATION
  - (i) PERMANENT SEEDING
  - (ii) LIMEROCK LINED CHANNEL AND LIMEROCK CORE DOWN CENTER OF COULEE
  - (iii) NEW STORM DRAIN PIPE
  - (iv) TERRACE EXISTING ROCK SLOPES

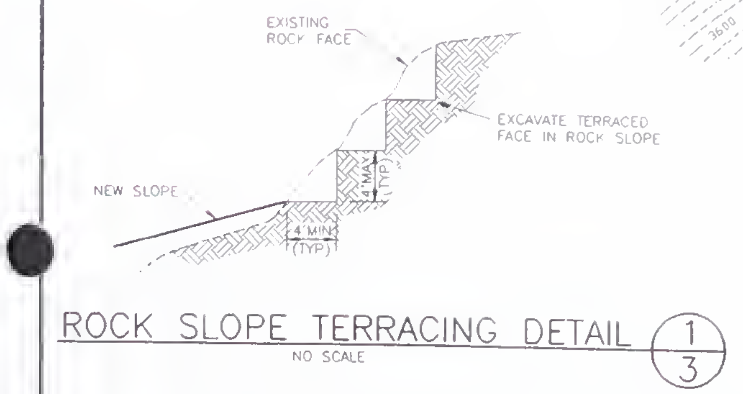
c. GOOD HOUSEKEEPING AND MATERIAL HANDLING
  - (i) TO PREVENT TRACKING OF SEDIMENT OFF-SITE, PRIOR TO LEAVING THE SITE, ALL VEHICLES SHALL BE WASHED DOWN ON-SITE AT SUCH A LOCATION AS TO CONTAIN ALL WASHED SEDIMENT ON-SITE (i.e. ABOVE STRAW BALE OR SILT FENCE DIKE)
  - (ii) FUEL, OIL GREASE AND OTHER SUCH MATERIALS SHALL BE STORED IN ONE LOCATION WITHIN THE STAGING AREA. ALL MATERIALS SHALL BE STORED IN A BERMED PLASTIC LINED STORAGE AREA WITH A CAPACITY OF 110 PERCENT OF THE LARGEST CONTAINER ABSORBENT MATERIAL SHALL BE AVAILABLE ON-SITE FOR CLEAN UP OF ANY SPILLS
  - (iii) FERTILIZER SHALL BE STORED ON PALLETS OFF GROUND AND COVERED WITH PLASTIC OR IN OTHER SUCH MANNER AS TO PREVENT SPILLAGE AND WASHING FROM RAIN WATER INTO SURROUNDING SOIL OR OFF-SITE

SUBSIDENCE DATA

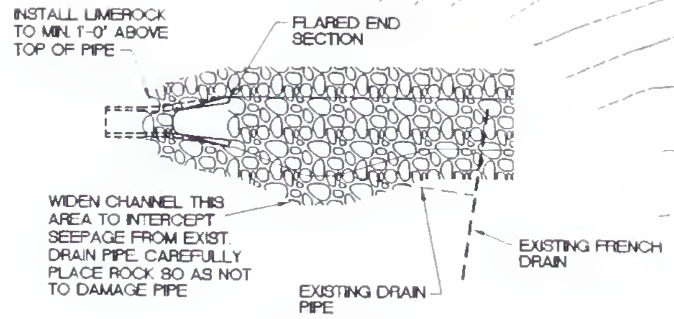
SUBSIDENCE	MAX DEPTH (FT)	APPROX QUANTITY IMPORTED FILL REQUIRED (C.Y.)
S4	2.5	4.0
S5	8.5	63.0
S6	3.5	12.0
S7	4.0	5.5
S8	2.0	2.8
S9	8.0	36.8
S10	6.0	69.0
S11	9.0	36.8
S12	8.0	90.0
S13	10.0	55.0
S14	2.5	2.8
S15	2.5	5.7
S16	5.0	4.5
S17	2.0	14.4
S18	9.0	25.3
S19	6.0	48.3
S20	4.5	4.0
S21	5.5	10.3
S22	5.5	12.0
S23	3.5	3.5
S24	6.0	9.8
S25	2.0	4.0
S26	4.5	8.6
S27	4.5	9.2
S28	6.0	9.2
S29	4.0	3.4
S30	5.0	8.6
TOTAL		558.5

CRACK DATA

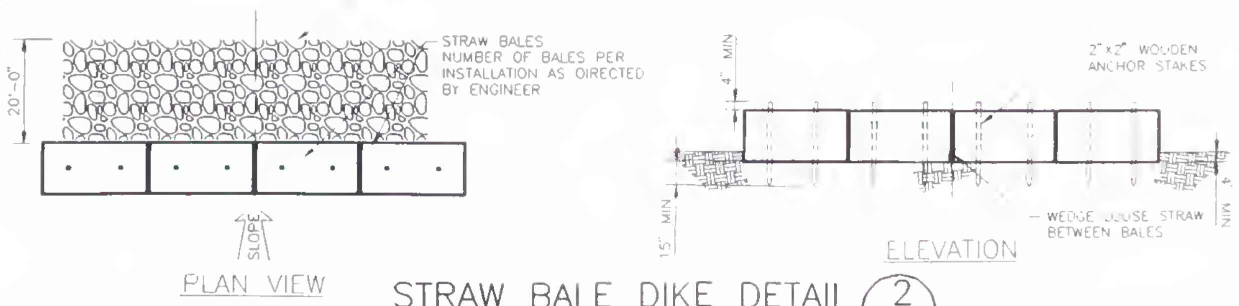
CRACK	AVERAGE DIMENSIONS LENGTH (FT)	WIDTH (FT)	DEPTH (FT)	CLOSURE TYPE	APPROX QUANTITY GRANULAR BACKFILL REQUIRED (C.Y.)
C20	77	3.5	2.0	2	23.0
C21	18	0.8	4.0	2	2.5
C22	33	5.0	3.0	2	21.5
C23	38	4.5	3.0	2	22.0
C24	17	3.0	3.5	2	8.0
C25	58	3.5	3.0	2	30.0
C26	30	6.0	3.0	2	23.0
C27	28	5.0	6.0	2	35.0
C28	36	3.0	3.0	2	13.5
C29	96	3.0	1.0	2	12.0
C30	20	1.5	4.0	2	5.0
C31	27	1.0	3.5	2	4.0
TOTAL					199.5



ROCK SLOPE TERRACING DETAIL 1/3
NO SCALE


INSTALL LIMEROCK TO MIN. 1'-0" ABOVE TOP OF PIPE
FLARED END SECTION
WIDEN CHANNEL THIS AREA TO INTERCEPT SEEPAGE FROM EXIST. DRAIN PIPE. CAREFULLY PLACE ROCK SO AS NOT TO DAMAGE PIPE
EXISTING FRENCH DRAIN
EXISTING DRAIN PIPE

DETAIL 3/3
NO SCALE


LIME ROCK
STRAW BALES NUMBER OF BALES PER INSTALLATION AS DIRECTED BY ENGINEER
20'-0"
SLOPE
PLAN VIEW
4" MIN
2"x2" WOODEN ANCHOR STAKES
15" MIN
WEDGE LOOSE STRAW BETWEEN BALES
4" MIN
ELEVATION

STRAW BALE DIKE DETAIL 2/3
NO SCALE

MONTANA TIMOTHY RANF NO. 8745E REGISTERED PROFESSIONAL ENGINEER

DRAWN TWC/CAJ DATE 1\94
DESIGNED TPR JOB NO. 93-18
APPROVED DLZ F.B. NO. 740

REVISIONS
BY ___ DATE ___ DESCR ___
BY ___ DATE ___ DESCR ___
BY ___ DATE ___ DESCR ___

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS-BOZEMAN-KALISPELL MONTANA
SPOKANE WASHINGTON

TD&H

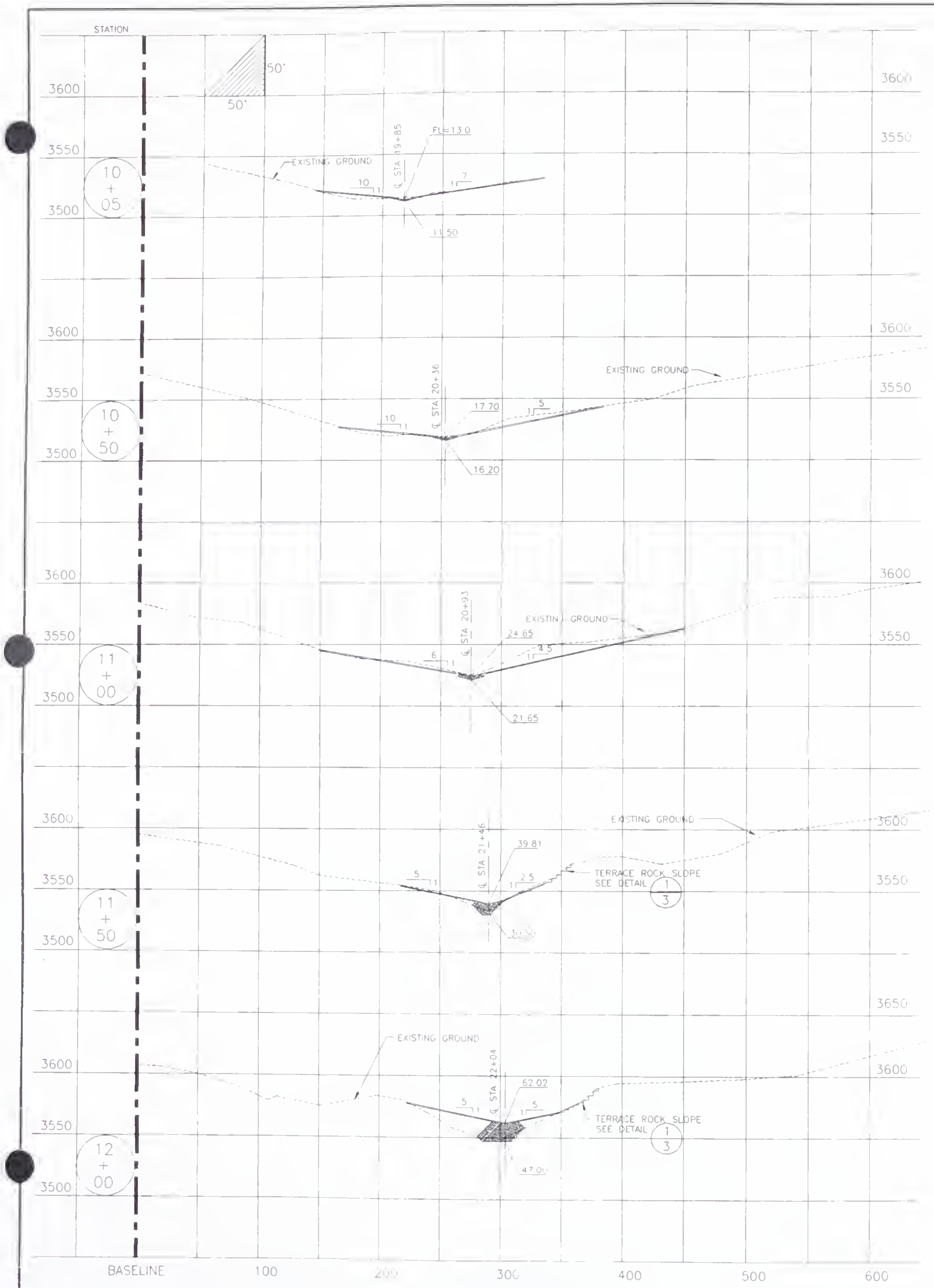
MONTANA DEPARTMENT OF STATE LANDS-AMRB
NELSON COAL SITE RECLAMATION

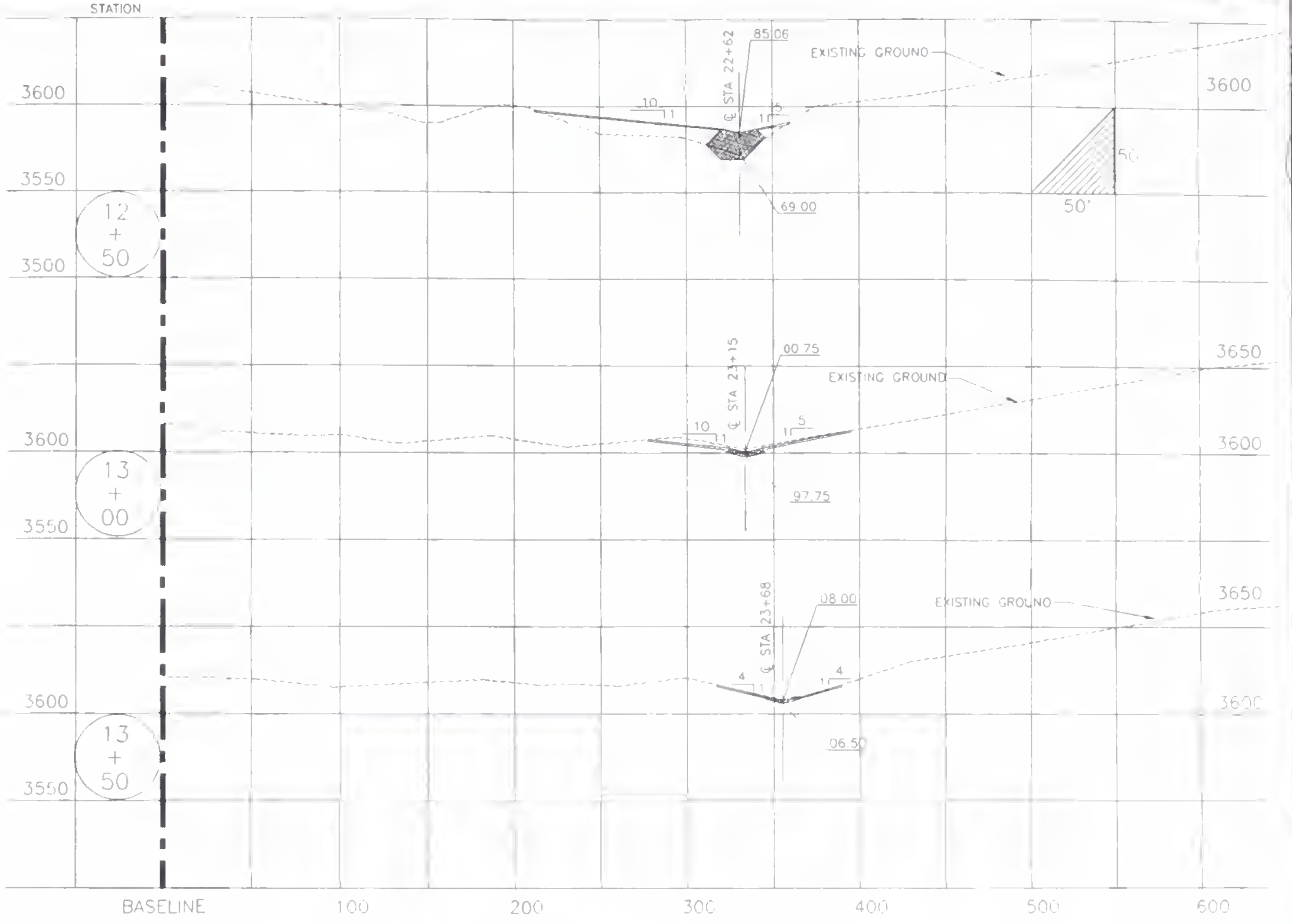
SAND COULEE, MONTANA
COULEE STABILIZATION GRADING PLAN

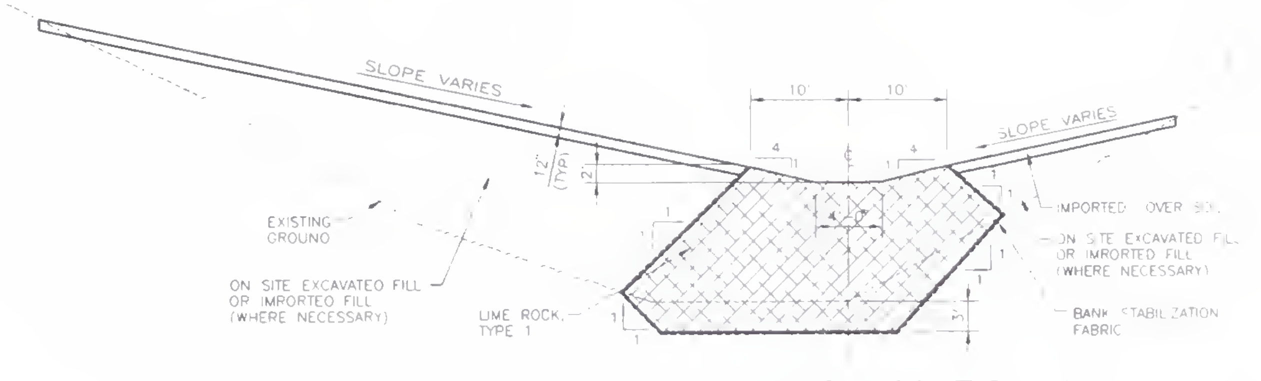
SHEET NO. 3
6 SHEETS

9318-3.DWG

Tue Feb 15 14:04:08 1994 TD&H - GREAT FALLS - (406) 761-3010



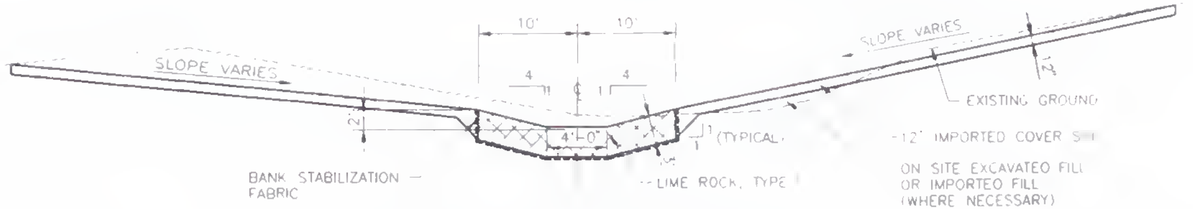



SLOPE VARIES
SLOPE VARIES
10'
10'
4
1
℄
1
4
12" (TYP)
2'
4'-0"
EXISTING GROUND
ON SITE EXCAVATED FILL OR IMPORTED FILL (WHERE NECESSARY)
LIME ROCK, TYPE 1
IMPORTED COVER SOIL
ON SITE EXCAVATED FILL OR IMPORTED FILL (WHERE NECESSARY)
BANK STABILIZATION FABRIC
3'

TYPICAL CROSS SECTION 1

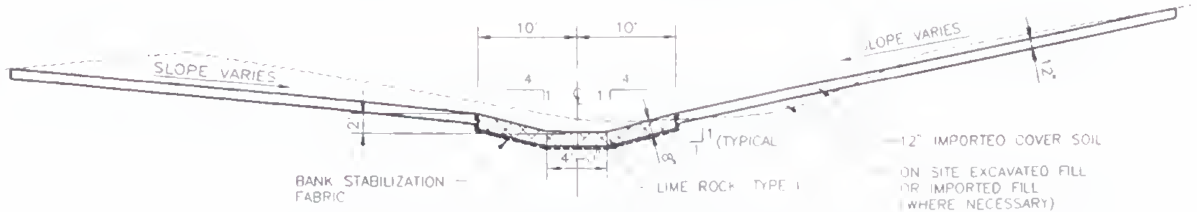
CENTERLINE STA 21+19 TO STA 23+04

0 10' 20' 30'
SCALE



TYPICAL CROSS SECTION 2

CENTERLINE STA 20+71 TO STA 21+19 AND STA 23+04 TO STA 23+5



TYPICAL CROSS SECTION 3

CENTERLINE STA 19+85 TO STA 20+71 AND STA 23+50 TO STA 24+00

4318-4.DWG

MONTANA
TIMOTHY P.
BANE
NO. 874 PE
REGISTERED
PROFESSIONAL ENGINEER

DRAWN TWC DATE 1\94
DESIGNED TPR JOB NO 93-18
APPROVED DLZ F.R. NO. 740

REVISIONS
BY ___ DATE ___ DESCR ___
BY ___ DATE ___ DESCR ___
BY ___ DATE ___ DESCR ___

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS–BOZEMAN–KALISPELL MONTANA
SPOKANE WASHINGTON

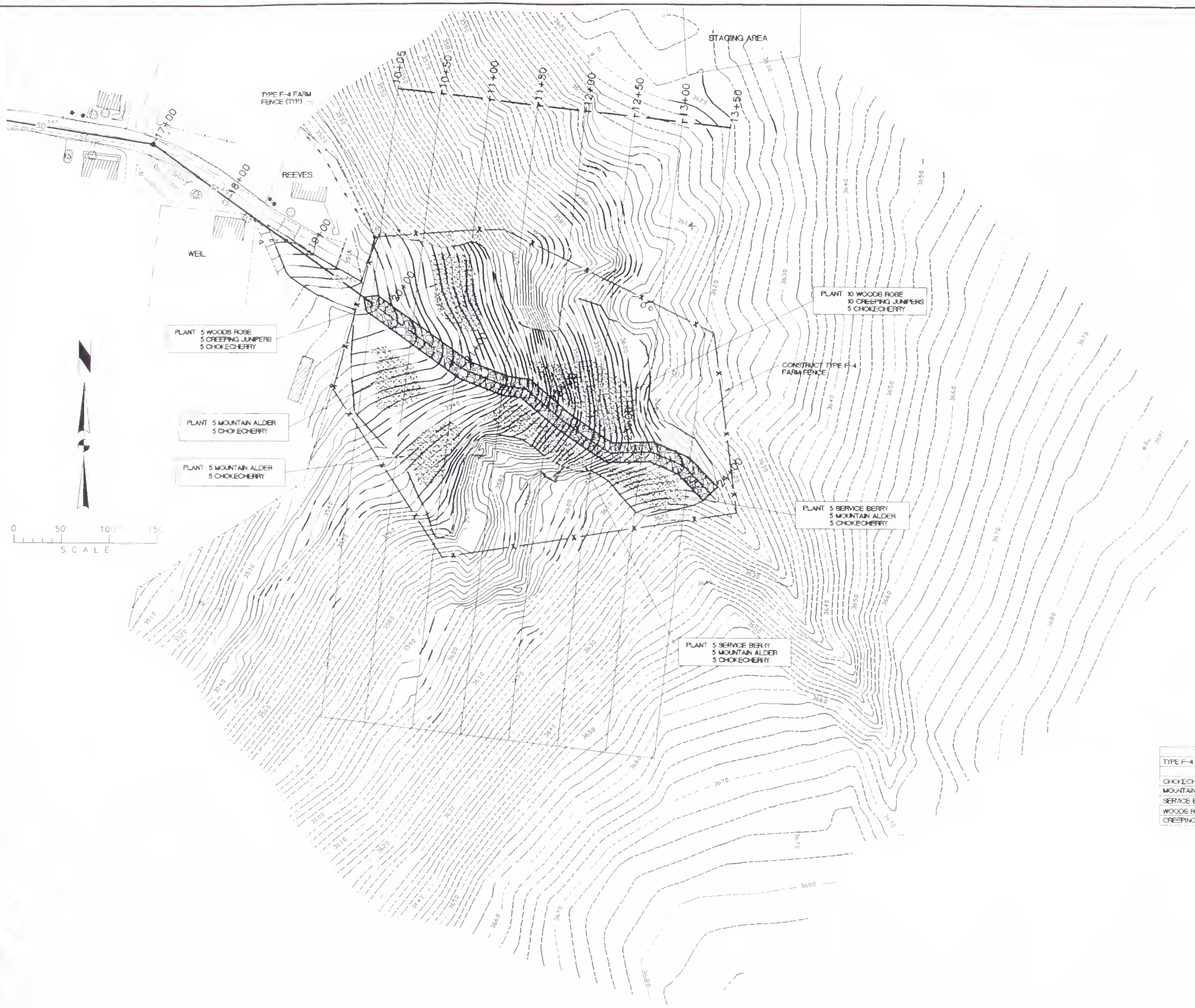
TD&H

MONTANA DEPARTMENT OF STATE LANDS–AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA
COULEE STABILIZATION CROSS SECTIONS

6 SHEETS

SHEET NO.
4



PLANT 5 WOODS ROSE
5 CREEPING JUNIPERS
5 CHOKECHERRY

PLANT 5 MOUNTAIN ALDER
5 CHOKECHERRY

PLANT 5 MOUNTAIN ALDER
5 CHOKECHERRY

PLANT 10 WOODS ROSE
10 CREEPING JUNIPERS
5 CHOKECHERRY

CONSTRUCT TYPE F-4 FARM FENCE

PLANT 5 SERVICE BERRY
5 MOUNTAIN ALDER
5 CHOKECHERRY

PLANT 5 SERVICE BERRY
5 MOUNTAIN ALDER
5 CHOKECHERRY

TOTAL QUANTITIES	
TYPE F-4 FARM FENCE	1235 LF
SEEDLINGS	
CHOKECHERRY	30 EA
MOUNTAIN ALDER	20 EA
SERVICE BERRY	10 EA
WOODS ROSE	15 EA
CREEPING JUNIPER	15 EA

MONTANA
TIMOTHY
RALL
NO.
REGISTERED
PROFESSIONAL ENGINEER

DRAWN TWC DATE 94
DESIGNED TPR JOB NO 93-18
APPROVED DLZ FB NO 740

REVISIONS
BY ____ DATE ____ DESCR ____
BY ____ DATE ____ DESCR ____
BY ____ DATE ____ DESCR ____

TD&H

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS–BOZEMAN–KALISPELL MONTANA
SPOKANE WASHINGTON

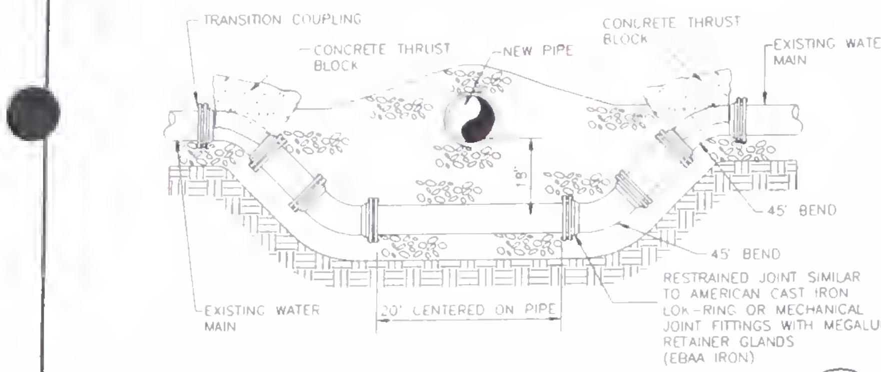
MONTANA DEPARTMENT OF STATE LANDS–AMRB
NELSON COAL SITE RECLAMATION
SAND COULEE, MONTANA
COULEE STABILIZATION PLANTING & FENCING PLAN

SHEET NO
5

6 SHEETS

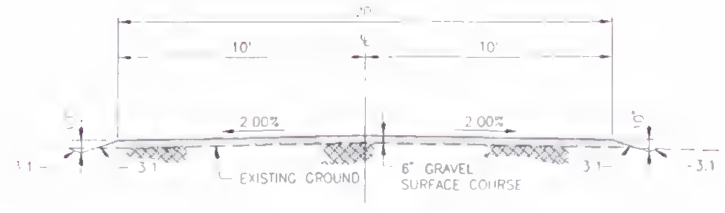
NOTES.

1. ENCASE NEW PIPE FITTINGS WITH 2 PLY POLYETHYLENE PIPE WRAPPING
2. MINIMUM CLEARANCE BELOW NEW PIPE – 1' 6"
3. BACKFILL CROSSING AREA WITH PIPE BEDDING MATERIAL TYPE 1
4. PIPE SHALL BE PVC CONFORMING TO AWWA C900, DR18

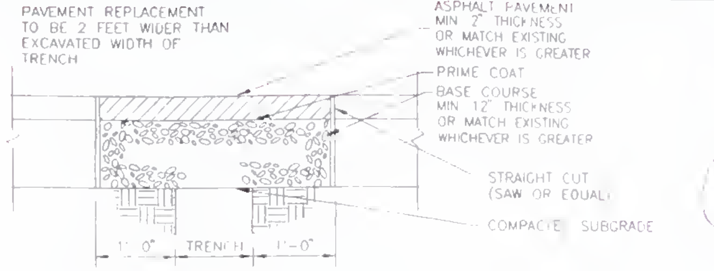


EXISTING WATER LINE ADJUSTMENT DETAIL ① / 6

NO SCALE

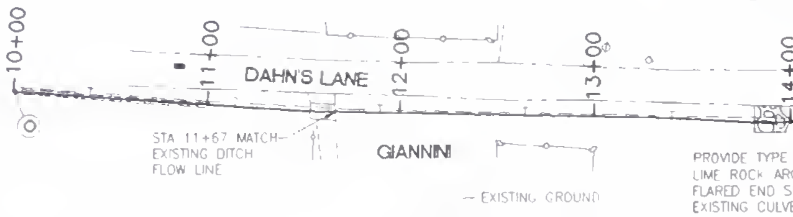


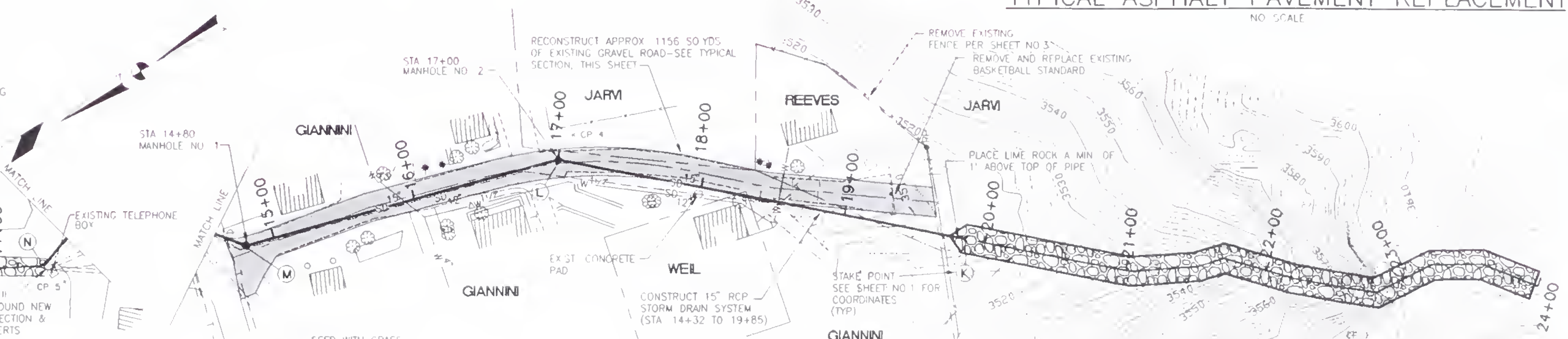
TYPICAL GRAVEL ROAD SECTION


PAVEMENT REPLACEMENT TO BE 2 FEET WIDER THAN EXCAVATED WIDTH OF TRENCH
ASPHALT PAVEMENT MIN 2" THICKNESS OR MATCH EXISTING WHICHEVER IS GREATER
PRIME COAT
BASE COURSE MIN 12" THICKNESS OR MATCH EXISTING WHICHEVER IS GREATER
STRAIGHT CUT (SAW OR EQUAL)
COMPACTED SUBGRADE
1'-0"
TRENCH
1'-0"

TYPICAL ASPHALT PAVEMENT REPLACEMENT

NO SCALE


10+00
11+00
DAHN'S LANE
12+00
13+00
14+00
STA 11+67 MATCH EXISTING DITCH FLOW LINE
GIANNINI
EXISTING GROUND
LIME ROCK, TYPE II (MIN 18" THICKNESS)


MATCH LINE
EXISTING TELEPHONE BOX
CP 5
PROVIDE TYPE II LIME ROCK AROUND NEW FLARED END SECTION & EXISTING CULVERTS
STA 14+80 MANHOLE NO 1
MATCH LINE
15+00
16+00
GIANNINI
STA 17+00 MANHOLE NO 2
17+00
CP 4
JARVI
RECONSTRUCT APPROX 1156 SQ YDS OF EXISTING GRAVEL ROAD-SEE TYPICAL SECTION, THIS SHEET
18+00
REEVES
19+00
EXIST CONCRETE PAD
WEIL
CONSTRUCT 15" RCP STORM DRAIN SYSTEM (STA 14+32 TO 19+85)
GIANNINI
REMOVE EXISTING FENCE PER SHEET NO 3
REMOVE AND REPLACE EXISTING BASKETBALL STANDARD
JARVI
PLACE LIME ROCK A MIN OF 1' ABOVE TOP OF PIPE
STAKE POINT SEE SHEET NO 1 FOR COORDINATES (TYP)
GIANNINI
20+00
21+00
22+00
23+00
24+00
3520
3530
3540
3550
3560
3580
3590
3600
3610

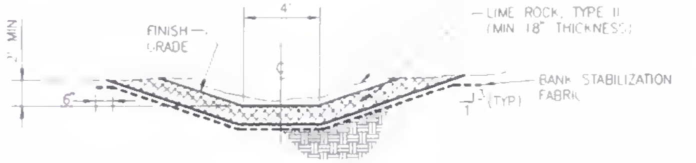
SEED WITH GRASS
EXISTING GROUND

SEE SHEET NO FOR SITE PLAN

0 50 100 150
SCALE

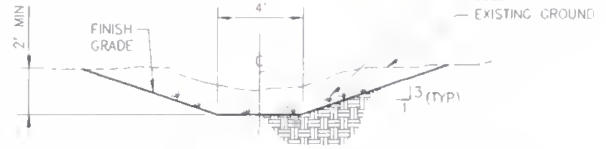
1. WHERE WATER SERVICE LINES REQUIRE ADJUSTMENT TO PROVIDE AT LEAST 12 INCHES CLEARANCE BETWEEN NEW PIPE AND EXISTING SERVICE, EXISTING SERVICE LINE SHALL BE ADJUSTED USING PIPE MATERIALS TO MATCH EXISTING PIPE. ADJUSTMENT SHALL BE MADE SIMILAR TO EXISTING WATER LINE ADJUSTMENT DETAIL SHOWN ON THIS SHEET

NOTE SEE SHEET NO 4 FOR TYPICAL SECTIONS



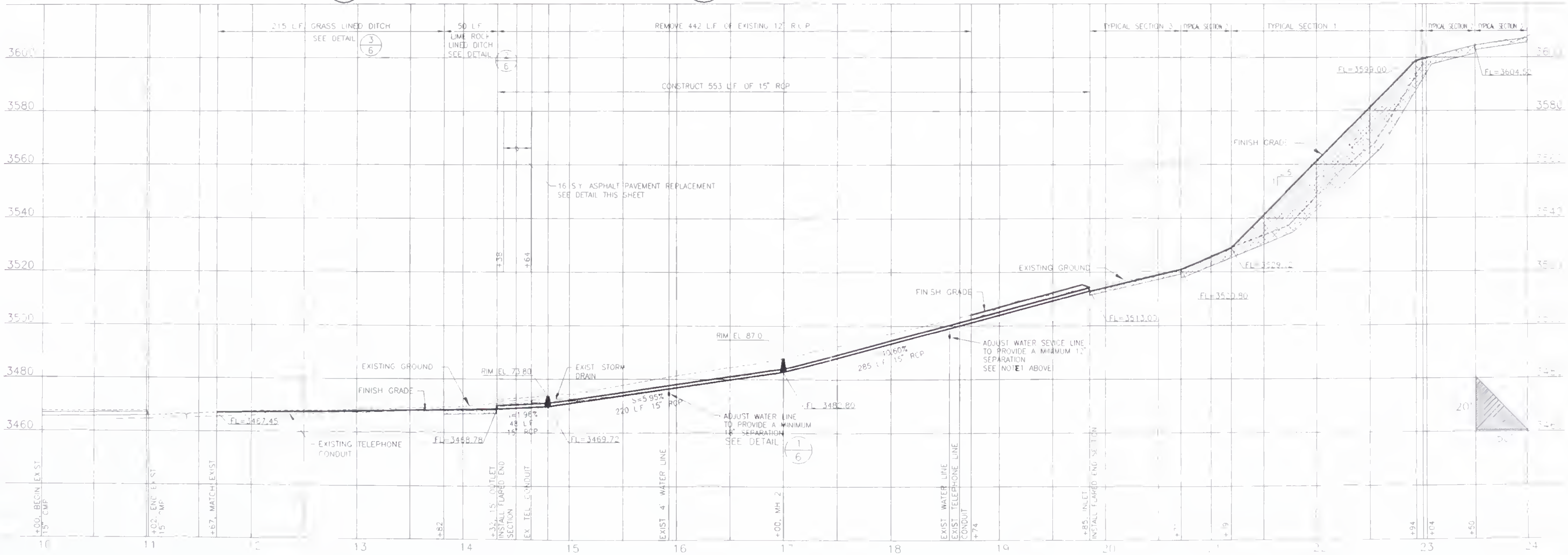
LIME ROCK LINED DITCH DETAIL ② / 6

NO SCALE



GRASS LINED DITCH DETAIL ③ / 6

NO SCALE



MONTANA PROFESSIONAL ENGINEER
TIMOTHY
NO 8742PE

DRAWN TWC DATE 3-94
DESIGNED TPR JOB NO 93-18
APPROVED DLZ F.B. NO 740

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS–BOZEMAN–KALISPELL MONTANA
SPOKANE WASHINGTON

REVISIONS
BY DATE DESCR
BY DATE DESCR
BY DATE DESCR

TDH

MONTANA DEPARTMENT OF STATE LANDS–AMRB
NELSON COAL SITE RECLAMATION
SAND COULEE, MONTANA
STORM DRAIN PLAN & PROFILE

6

SHEET NO
6

ATTACHMENT 6

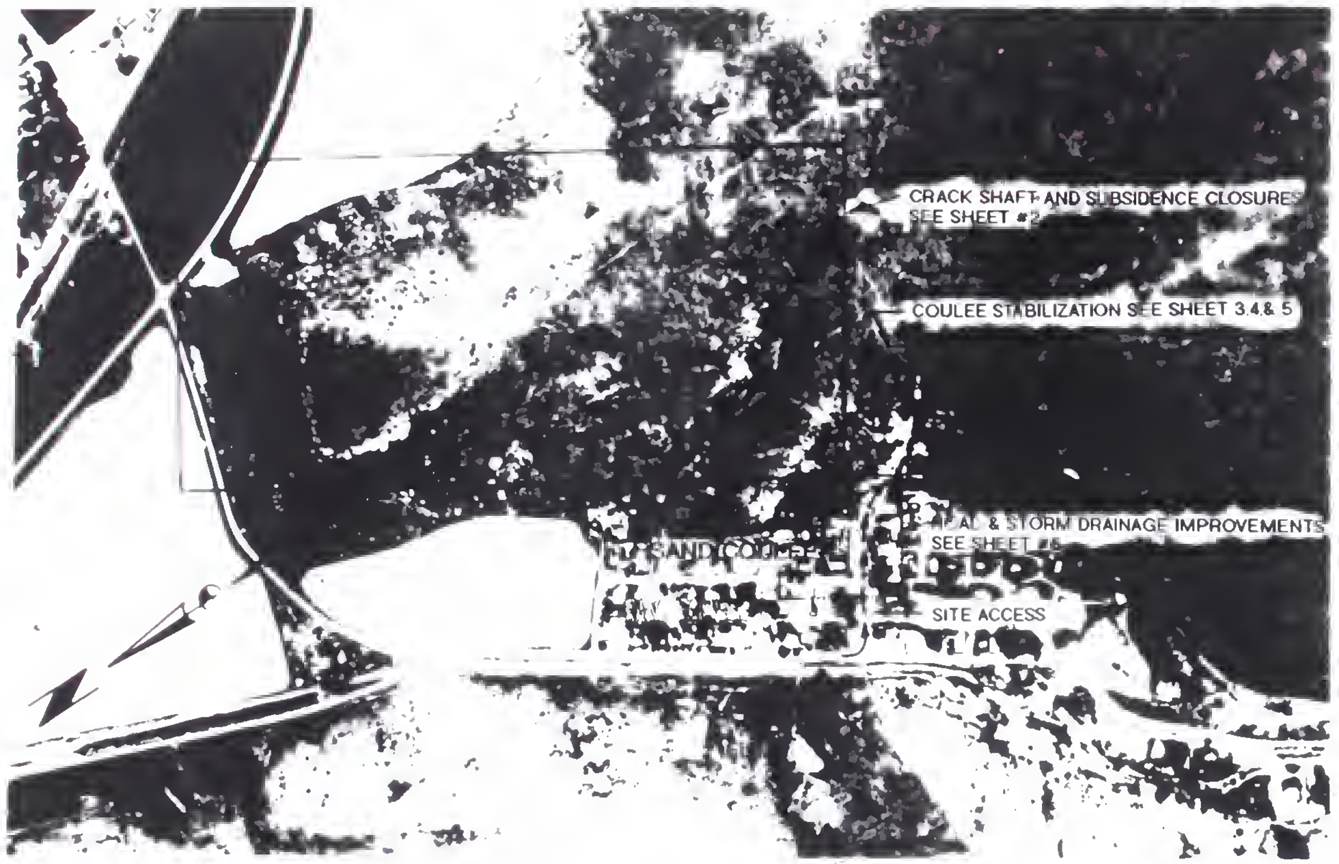
AS-BUILT DRAWINGS

ATTACHMENT 6

AS-BUILT DRAWINGS

MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU

NELSON COAL SITE RECLAMATION
PROJECT NO: DSL-AMRB NO. 93-013
JANUARY, 1994


CRACK SHAFT AND SUBSIDENCE CLOSURES SEE SHEET #2
COULEE STABILIZATION SEE SHEET 3,4 & 5
SAND COULEE
RAL & STORM DRAINAGE IMPROVEMENTS SEE SHEET #6
SITE ACCESS

LOCATION MAP

0 400' 800' 1200'

APPROX SCALE

MONTANA
ABANDONED MINE
RECLAMATION BUREAU

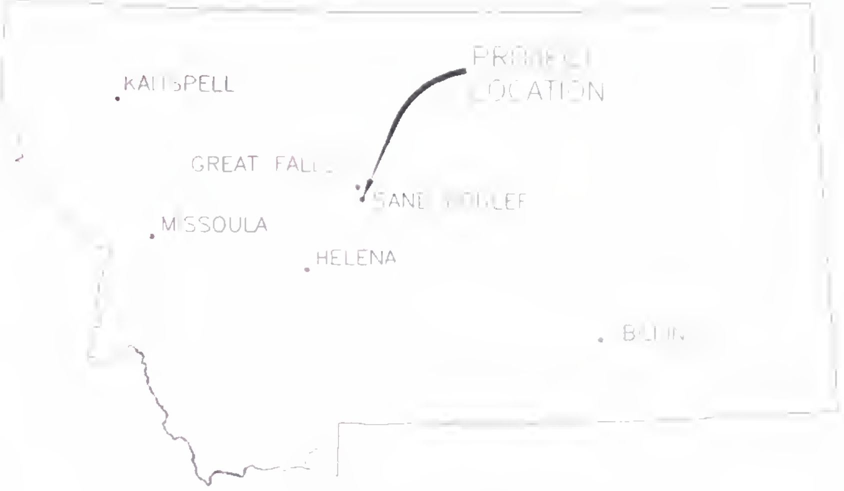


TABLE OF CONTENT

PAGE	DESCRIPTION
1	COVER SHEET
2	CRACK, SHAFT AND SUBSIDENCE CLOSURES
3	COULEE STABILIZATION GRADING PLAN
4	COULEE STABILIZATION CROSS-SECTIONS
5	COULEE STABILIZATION PLANTING AND FENCING PLAN
6	STORM DRAIN PLAN AND PROFILE

CONTROL POINT INFORMATION

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP1	583 86	647 88	3601 45	5/8" REBAR
CP2	1015 39	647 88	3619 30	5/8" PEBAR
CP4	942 99	210 63	3491 06	5/8" REBAR
CP5	988 22	-71 50	3472 82	5/8" REBAR

STAKE POINT INFORMATION

STAKE POINT	NORTHING	EASTING	STATION	DESCRIPTION
A	987 40	451 72	10+05	BASE LINE
B	947 40	794 36	13+50	BASE LINE
C	571 31	775.76	24+00	RIPRAP CHANNEL
D	600 43	747 67	23+60	RIPRAP CHANNEL
E	614 46	715.72	23+25	RIPRAP CHANNEL
F	613 76	672 19	22+82	RIPRAP CHANNEL
G	646.74	623.04	22+22	PIPRAP CHANNEL
H	679 02	585 48	21+72	RIPRAP CHANNEL
I	681 47	565 47	21+50	RIPRAP CHANNEL
J	698 31	522 28	21+03	RIPRAP CHANNEL
K	765.67	427.14	19+86	STORM ORAIN INLET
L	931 62	194 03	17+00	STORM ORAIN MH
M	967 05	-25 74	14+80	STORM DRAIN MH
N	1001 78	-59 09	14+32	STORM DRAIN OUTLET
O	1429 45	-0.11	10+00	ENO CULVERT

LEGEND

NEW	EXIST	DESCRIPTION
	— — SD 12" —	STORM DRAIN
—SD 15"—		STORM DRAIN
—●—		STORM DRAIN MANHOLE
	—— W 4" ——	WATER LINE
	— — T — —	TELEPHONE CONDUIT
	—— - - ——	PROPERTY LINE
▨		LIME ROCK CORE CHANNEL
▨		ROCK SLOPE STEP TREATMENT AREA
▨		MAIN COULLEE FILL DISTURBED
	—→—→	DITCH
— x —	—·—	FENCE
		HOLE
	▨	BUILDING
		SUBSIDENCE
		CRACK
	— - 3680 —	MAJOR CONTOUR
	- - - -	MINOR CONTOUR
——		NEW CONTOUR
	▨	ROCK SLIDE AREA
——		BASELINE
		ERODED AREA
——		CATCH LIMITS
		NEW ACCESS ROAD
	● TP# 03	TEST PIT
▭		GRAVEL ROAD RESURFACING

ABBREVIATIONS

CPE	CORRUGATED POLYETHYLENE
F.L	FLOW LINE
MIN	MINIMUM
EXIST, EX	EXISTING
', FT	FEET
", IN	INCHES
CMP	CORRIGATED METAL PIPE
GB	GRADE BREAK

GENERAL NOTES

AN ABANDONED COAL MINE UNDERLIES THIS SITE MANY POTENTIAL HAZARDS EXIST THE EXTENT OF THESE HAZARDS IS NOT FULLY KNOWN CONTRACTOR AND OTHEP PERSONS WORKING AT THE SITE SHALL APPRISE THEMSELVES OF THE CONDITIONS AND TAKE WHATEVER PRECAUTIONS ARE DEEMED NECESSARY INSURE SAFETY WHILE PREFOPMING THEIR DUTIES

THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN WRITING AND SHALL BE RESPONSIBLE FOR SECURING THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE BEGINNING EXCAVATION

ALL POWER, TELEPHONE ANO OTHER UTILITY POLES OR GUY WIRES WHICH INTERFERE WITH THE CONSTRUCTION SHALL BE REMOVED OR RELOCATED BY THE UTILITY COMPANY

4 THE CONTRACTOR SHALL EXCAVATE ALL WATER AND UTILITY LINES PRIOR TO BEGINNING TRENCH EXCAVATION TO INSURE CROSSING CLEARANCE

5 ALL CULVERTS AND DRAINAGE DITCHES AFFECTED BY CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION, UNLESS OTHEPWISE NOTED ON PLANS

6 AREAS OISTURBED BY CONSTPUCTION SHALL BE RESEEDED

7 MAINTAIN A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN OUTSIDE OF SEWER STORM DRAINS & WATEP LINE CROSSINGS

TIMOTHY P. RANF
NO 8742PE

DRAWN JTR	DATE 1-94
DESIGNED TPR	JOB NO 93-18
APPROVED DLE	FB NO 740

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS-BOZEMAN-KALISPELL MONTANA
SPOKANE WASHINGTON

TD&H

AS-BUILT DRAWING

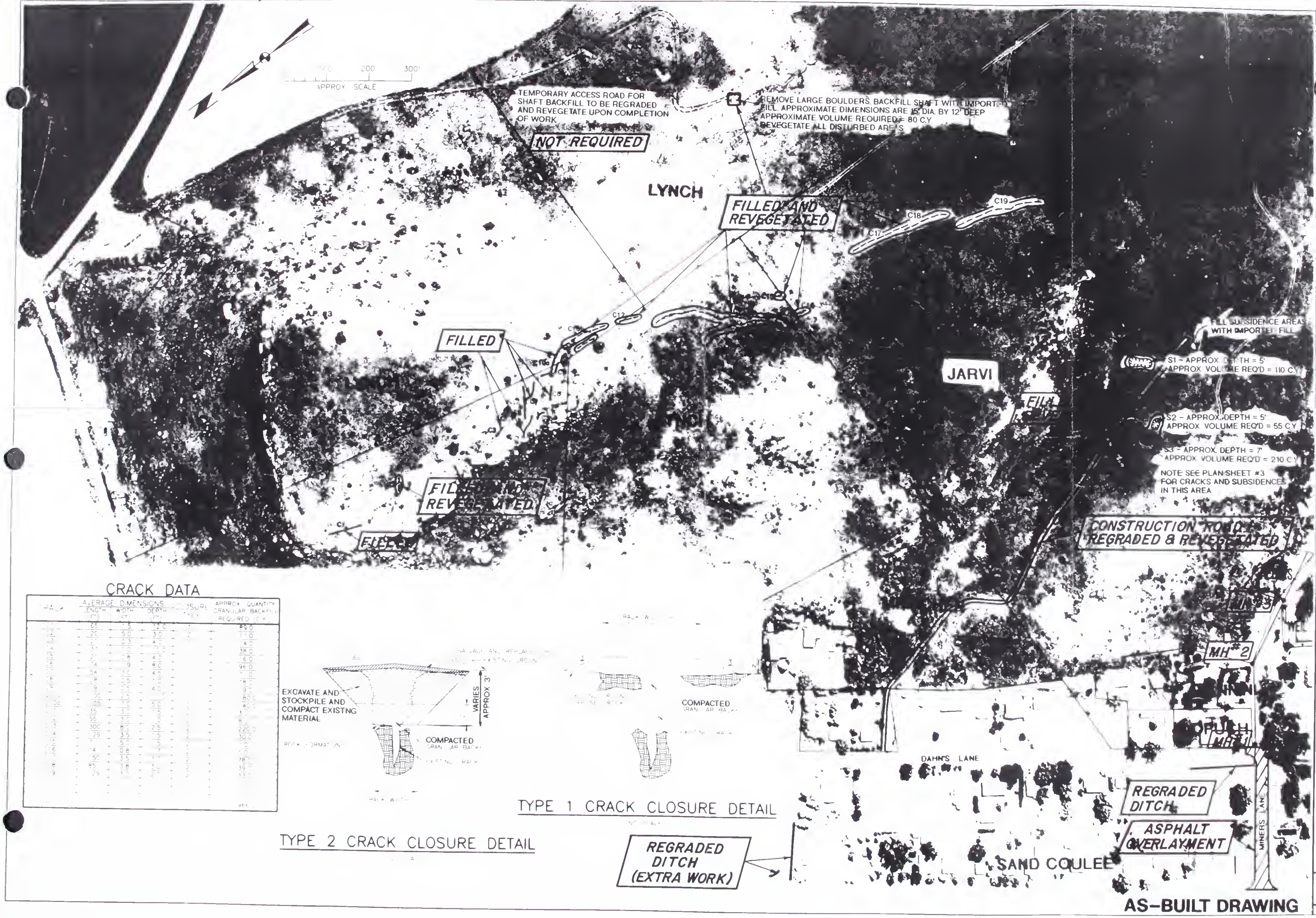
MONTANA DEPARTMENT OF STATE LAND-AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA
COVER SHEET

6

SHEET NO.
1

9318-1.DWG


0 100 200 300'
APPROX SCALE
N
TEMPORARY ACCESS ROAD FOR SHAFT BACKFILL TO BE REGRADED AND REVEGETATE UPON COMPLETION OF WORK
NOT REQUIRED
REMOVE LARGE BOULDERS, BACKFILL SHAFT WITH IMPORTED FILL. APPROXIMATE DIMENSIONS ARE 15' DIA. BY 12' DEEP APPROXIMATE VOLUME REQUIRED = 80 C.Y. REVEGETATE ALL DISTURBED AREAS
LYNCH
FILLED AND REVEGETATED
C17
C18
C19
C12
FILLED
JARVI
FILL SUBSIDENCE AREAS WITH IMPORTED FILL
S1 - APPROX. DEPTH = 5' APPROX. VOLUME REQ'D = 110 C.Y.
S2 - APPROX. DEPTH = 5' APPROX. VOLUME REQ'D = 55 C.Y.
S3 - APPROX. DEPTH = 7' APPROX. VOLUME REQ'D = 210 C.Y.
NOTE: SEE PLAN SHEET #3 FOR CRACKS AND SUBSIDENCES IN THIS AREA
FILLED AND REVEGETATED
FILLED
CONSTRUCTION ROAD REGRADED & REVEGETATED
MH #3
MH #2
MH #1
DAHN'S LANE
MINERS LANE
REGRADED DITCH
ASPHALT OVERLAYMENT
REGRADED DITCH (EXTRA WORK)
SAND COULEE
EXCAVATE AND STOCKPILE AND COMPACT EXISTING MATERIAL
VARIES APPROX 3'
COMPACTED GRANULAR BACKFILL
ROCK FORMATION
EXISTING ROCK
COMPACTED GRANULAR BACKFILL
CRACK WIDTH

TYPE 1 CRACK CLOSURE DETAIL

TYPE 2 CRACK CLOSURE DETAIL

CRACK DATA

CRACK	AVERAGE DIMENSIONS LENGTH (FT)	WIDTH (FT)	DEPTH (FT)	CLOSURE TYPE	APPROX. QUANTITY GRANULAR BACKFILL REQUIRED (C.Y.)
[illegible]	65	[illegible]	[illegible]	[illegible]	89.0
[illegible]	20	5.0	3.0	[illegible]	[illegible]
[illegible]	[illegible]	0.3	4.0		[illegible]
[illegible]	37	[illegible]	[illegible]		38.0
[illegible]	[illegible]	0.8	4.0		[illegible]
[illegible]	[illegible]	[illegible]	8.0		96.0
	54	3.0	4.5		[illegible]
[illegible]	[illegible]	0.5	[illegible]		[illegible]
[illegible]	9	[illegible]	4.0		9.0
	[illegible]	2.5			80.0
[illegible]	[illegible]	7.0	5.0		40.0
	35	3.0	[illegible]		[illegible]
[illegible]	55	3.0	[illegible]		[illegible]
[illegible]	300	8.0	2.5	2	220.0
[illegible]	29	3.5	[illegible]	2	30.0
[illegible]	[illegible]	5.0	5	2	[illegible]
[illegible]	[illegible]	0.8	7	2	[illegible]
	[illegible]	3.5	[illegible]	2	78.0
[illegible]	85	3.8	[illegible]	2	39.0
9	29	[illegible]	[illegible]	2	[illegible]
					966

AS-BUILT DRAWING

MONTANA
TIMOTHY
PROFESSIONAL ENGINEER

REVISIONS

DRAWN JTR DATE 2/93
DESIGN TPR JOB NO. 93 18

THOMAS, DEAN & HOSKINS INC
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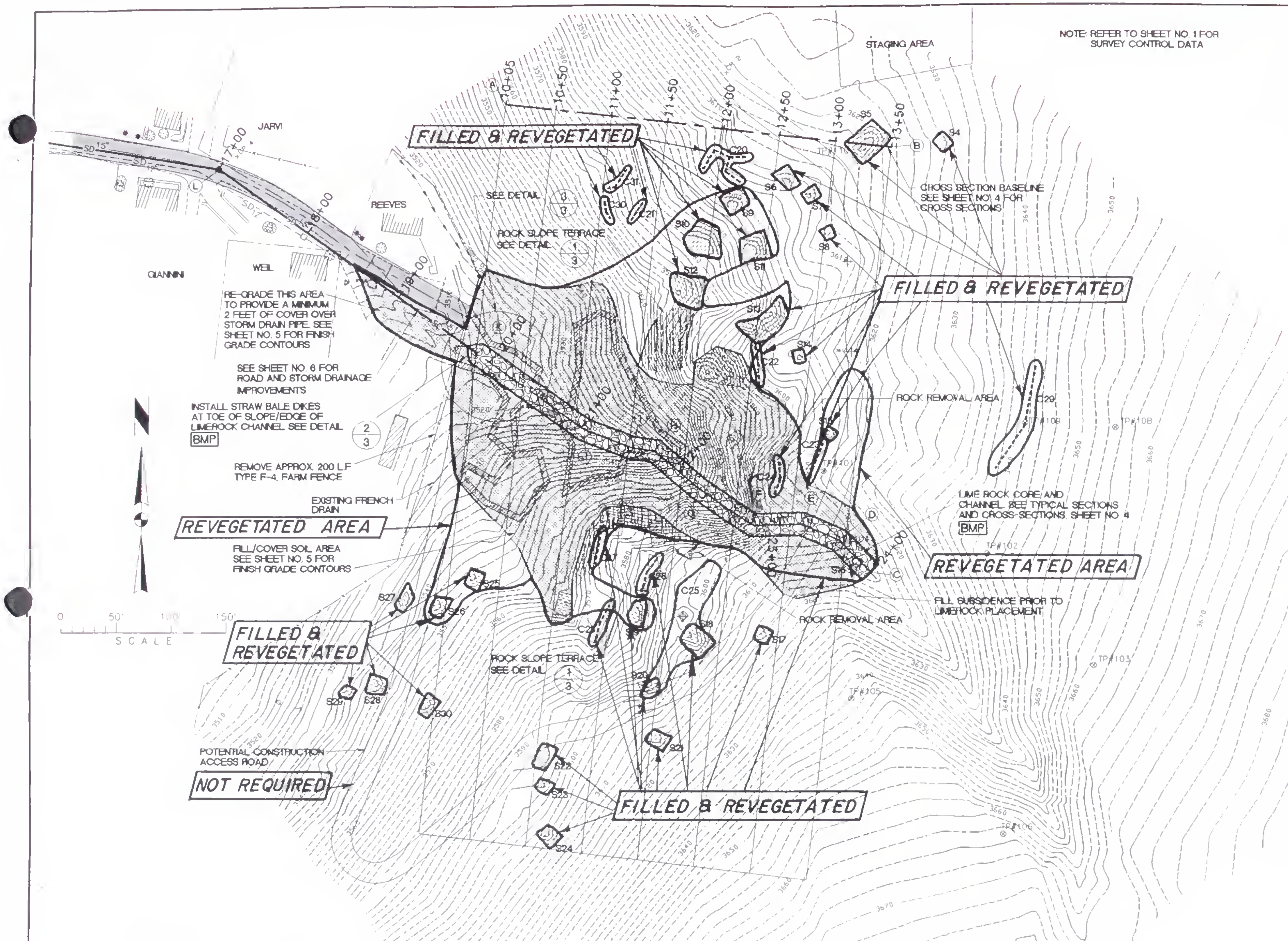
MONTANA DEPARTMENT OF STATE LAND-AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA
CRACK, SHAFT AND SUBSIDENCE CLOSURES

6

2

NOTE: REFER TO SHEET NO. 1 FOR SURVEY CONTROL DATA


STAGING AREA
JARVI
REEVES
WEIL
GIANNINI
SD 15"
SD 12"
17+00
18+00
19+00
10+00
10+05
10+50
11+00
11+50
12+00
12+50
13+00
13+50
24+00
FILLED & REVEGETATED
SEE DETAIL 3/3
ROCK SLOPE TERRACE SEE DETAIL 1/3
CROSS SECTION BASELINE SEE SHEET NO. 4 FOR CROSS SECTIONS
RE-GRADE THIS AREA TO PROVIDE A MINIMUM 2 FEET OF COVER OVER STORM DRAIN PIPE. SEE SHEET NO. 5 FOR FINISH GRADE CONTOURS
SEE SHEET NO. 6 FOR ROAD AND STORM DRAINAGE IMPROVEMENTS
INSTALL STRAW BALE DIKES AT TOE OF SLOPE/EDGE OF LIMEROCK CHANNEL. SEE DETAIL 2/3
BMP
REMOVE APPROX. 200 L.F. TYPE F-4, FARM FENCE
EXISTING FRENCH DRAIN
REVEGETATED AREA
FILL/COVER SOIL AREA SEE SHEET NO. 5 FOR FINISH GRADE CONTOURS
ROCK REMOVAL AREA
LIME ROCK CORE AND CHANNEL. SEE TYPICAL SECTIONS AND CROSS-SECTIONS, SHEET NO. 4
FILL SUBSIDENCE PRIOR TO LIMEROCK PLACEMENT
POTENTIAL CONSTRUCTION ACCESS ROAD
NOT REQUIRED
0 50' 100' 150'
SCALE
S4 S5 S6 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27 S28 S29 S30
C20 C21 C22 C23 C24 C25 C29
TP#101 TP#102 TP#103 TP#105 TP#106 TP#108 TP#109
A B C D E L

STORMWATER EROSION CONTROL PLAN BEST MANAGEMENT PRACTICES (BMP)

THE FOLLOWING BMPs SHALL BE INSTALLED AND MAINTAINED THROUGHOUT CONSTRUCTION

a TEMPORARY STABILIZATION

- (i) INSTALLATION OF STRAW BALE DIKE AT TOE OF SLOPES AND ANY VEHICLE WASHDOWN AREAS AT ONSET OF CONSTRUCTION
- (ii) INSTALLATION OF STRAW BALE DIKE OR SILT FENCE ON DOWNSLOPE PERIMETER OF COVER SOIL STOCKPILE
- (iii) MULCHING OF ENTIRE DISTURBED AREA AFTER SEEDING AND FERTILIZING
- (iv) EROSION CONTROL MAT ON 2:1 SLOPE AREAS

b PERMANENT STABILIZATION

- (i) PERMANENT SEEDING
- (ii) LIMEROCK LINED CHANNEL AND LIMEROCK CORE DOWN CENTER OF COULEE
- (iii) NEW STORM DRAIN PIPE
- (iv) TERRACE EXISTING ROCK SLOPES

c GOOD HOUSEKEEPING AND MATERIAL HANDLING

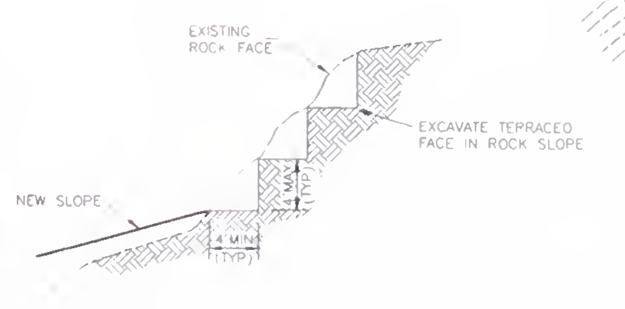
- (i) TO PREVENT TRACKING OF SEDIMENT OFF-SITE, PRIOR TO LEAVING THE SITE, ALL VEHICLES SHALL BE WASHED DOWN ON-SITE AT SUCH A LOCATION AS TO CONTAIN ALL WASHED SEDIMENT ON-SITE (i.e. ABOVE STRAW BALE OR SILT FENCE DIKE)
- (ii) FUEL, OIL GREASE AND OTHER SUCH MATERIALS SHALL BE STORED IN ONE LOCATION WITHIN THE STAGING AREA. ALL MATERIALS SHALL BE STORED IN A BERMED PLASTIC LINED STORAGE AREA WITH A CAPACITY OF 110 PERCENT OF THE LARGEST CONTAINER. ABSORBENT MATERIAL SHALL BE AVAILABLE ON-SITE FOR CLEAN UP OF ANY SPILLS
- (iii) FERTILIZER SHALL BE STORED ON PALLETS OFF GROUND AND COVERED WITH PLASTIC OR IN OTHER SUCH MANNER AS TO PREVENT SPILLAGE AND WASHING FROM RAIN WATER INTO SURROUNDING SOIL OR OFF-SITE

SUBSIDENCE DATA

SUBSIDENCE	MAX DEPTH (FT)	APPROX QUANTITY IMPORTED FILL REQUIRED (C.Y.)
S4	2.5	4.0
S5	8.5	63.0
S6	3.5	12.0
S7	4.0	5.5
S8	2.0	2.8
S9	8.0	36.8
S10	6.0	69.0
S11	9.0	36.8
S12	8.0	90.0
S13	10.0	55.0
S14	2.5	2.8
S15	2.5	5.7
S16	5.0	4.5
S17	2.0	14.4
S18	9.0	25.3
S19	6.0	48.3
S20	4.5	4.0
S21	5.5	10.3
S22	5.5	12.0
S23	3.5	3.5
S24	6.0	9.8
S25	2.0	4.0
S26	4.5	8.6
S27	4.5	9.2
S28	6.0	9.2
S29	4.0	3.4
S30	5.0	8.6
TOTAL		558.5

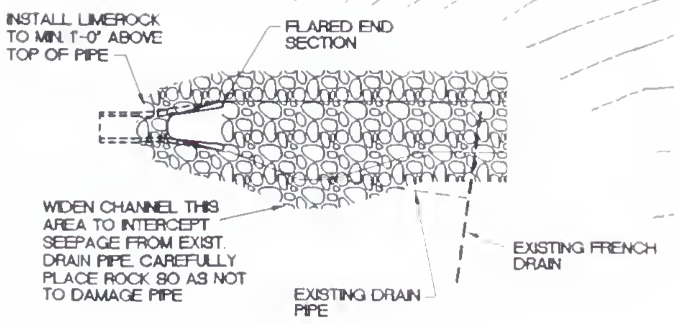
CRACK DATA

CRACK	AVERAGE DIMENSIONS			CLOSURE TYPE	APPROX QUANTITY GRANULAR BACKFILL REQUIRED (C.Y.)
	LENGTH (FT)	WIDTH (FT)	DEPTH (FT)		
C20	77	3.5	2.0	2	23.0
C21	18	0.8	4.0	2	2.5
C22	33	5.0	3.0	2	21.5
C23	38	4.5	3.0	2	22.0
C24	17	3.0	3.5	2	8.0
C25	58	3.5	3.0	2	30.0
C26	30	6.0	3.0	2	23.0
C27	28	5.0	6.0	2	35.0
C28	36	3.0	3.0	2	13.5
C29	96	3.0	1.0	2	12.0
C30	20	1.5	4.0	2	5.0
C31	27	1.0	3.5	2	4.0
TOTAL					199.5



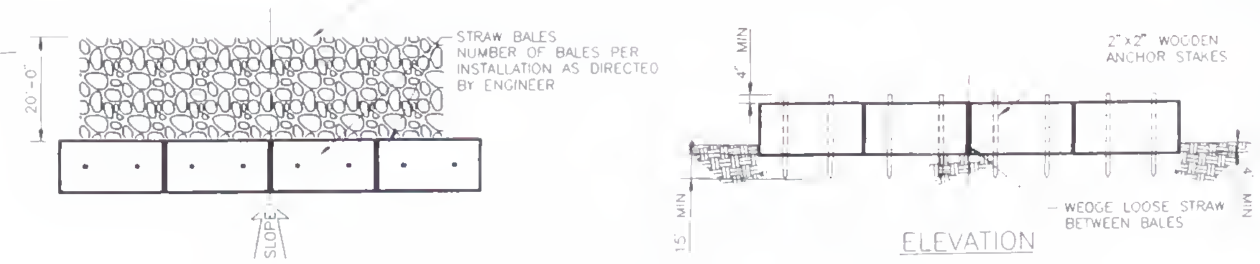
ROCK SLOPE TERRACING DETAIL 1/3

NO SCALE


INSTALL LIMEROCK TO MIN. 1'-0" ABOVE TOP OF PIPE
FLARED END SECTION
WIDEN CHANNEL THIS AREA TO INTERCEPT SEEPAGE FROM EXIST. DRAIN PIPE. CAREFULLY PLACE ROCK SO AS NOT TO DAMAGE PIPE
EXISTING DRAIN PIPE
EXISTING FRENCH DRAIN

DETAIL 3/3

NO SCALE


LIME ROCK
STRAW BALES NUMBER OF BALES PER INSTALLATION AS DIRECTED BY ENGINEER
20'-0"
SLOPE
PLAN VIEW
4" MIN
2"x2" WOODEN ANCHOR STAKES
15" MIN
4" MIN
WEDGE LOOSE STRAW BETWEEN BALES
ELEVATION

STRAW BALE DIKE DETAIL 2/3

NO SCALE

9318-3.DWG

AS-BUILT DRAWING

MONTANA
TIMOTHY RANE
NO. 6749E
REGISTERED PROFESSIONAL ENGINEER

DRAWN TWC/CAJ DATE 1\94
DESIGNED TPR JOB NO. 93-18
APPROVED DLZ F.B. NO. 740

REVISIONS
BY ____ DATE ____ DESCR ____
BY ____ DATE ____ DESCR ____
BY ____ DATE ____ DESCR ____

THOMAS, DEAN & HOSKINS INC.
ENGINEERING CONSULTANTS
GREAT FALLS–BOZEMAN–KALISPELL MONTANA
SPOKANE WASHINGTON

TD&H

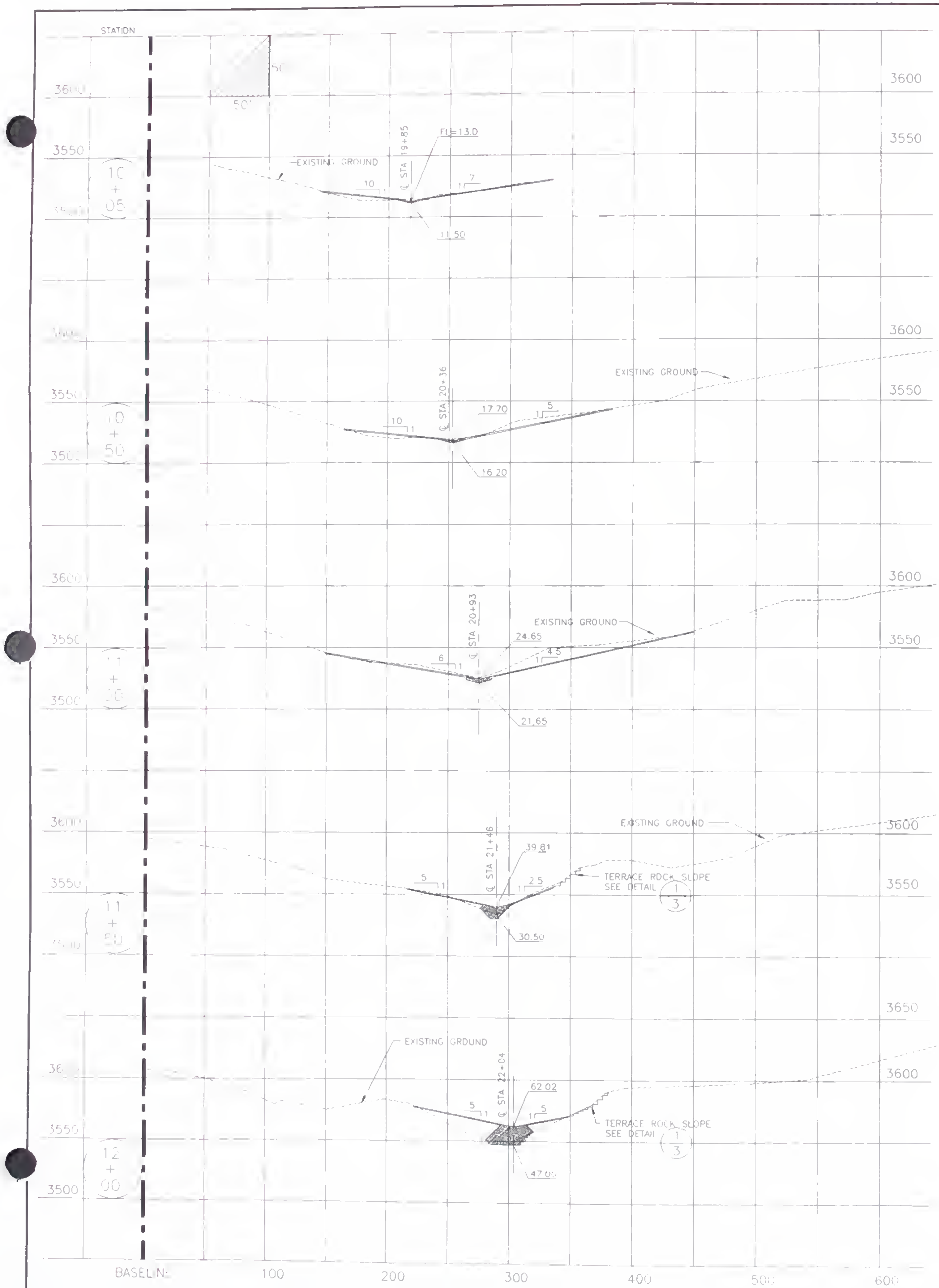
MONTANA DEPARTMENT OF STATE LANDS–AMRB
NELSON COAL SITE RECLAMATION

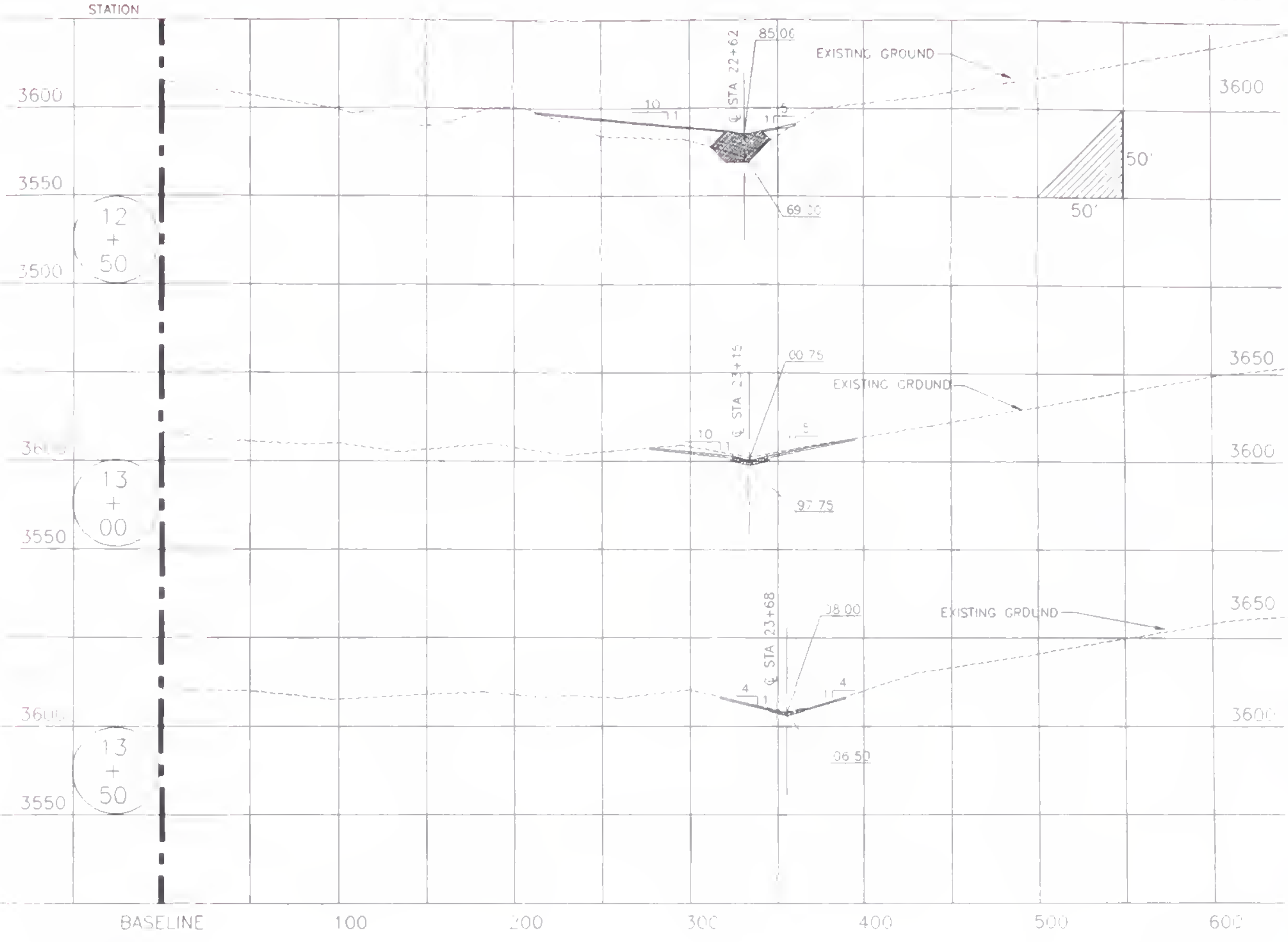
SAND COULEE, MONTANA
COULEE STABILIZATION GRADING PLAN

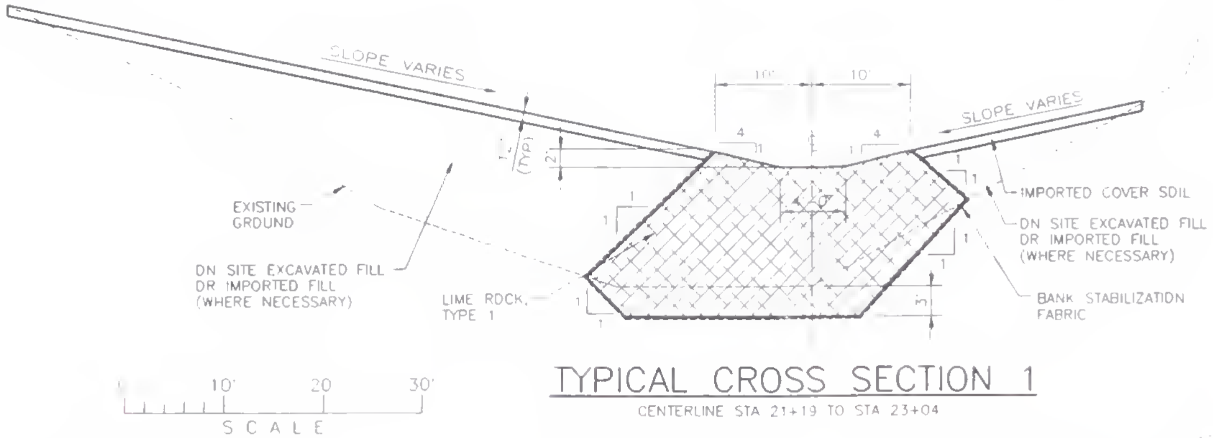
6 SHEETS

SHEET NO. 3

9318-3 Tue Feb 15 14:04:08 1994 TD&H - GREAT FALLS - (406) 761-3010

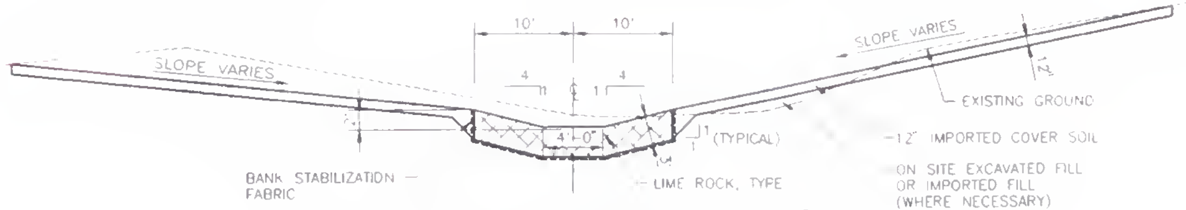





SLOPE VARIES
SLOPE VARIES
10'
10'
4
1
℄
1
4
1' (TYP)
2'
4'-0"
EXISTING GROUND
ON SITE EXCAVATED FILL OR IMPORTED FILL (WHERE NECESSARY)
LIME ROCK, TYPE 1
IMPORTED COVER SOIL
ON SITE EXCAVATED FILL OR IMPORTED FILL (WHERE NECESSARY)
BANK STABILIZATION FABRIC
3'
10'
20
30'
SCALE

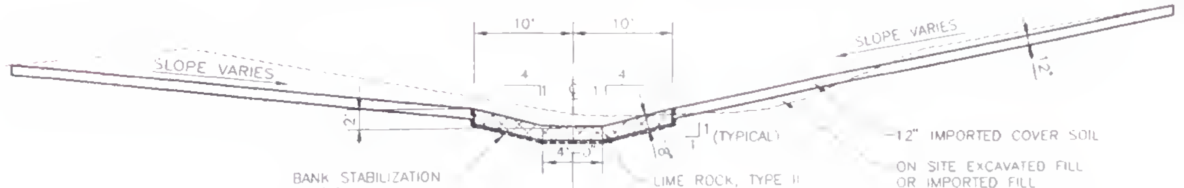
TYPICAL CROSS SECTION 1

CENTERLINE STA 21+19 TO STA 23+04



TYPICAL CROSS SECTION 2

CENTERLINE STA 20+71 TO STA 21+19 AND STA 23+04 TO STA 23+50



TYPICAL CROSS SECTION 3

CENTERLINE STA 19+85 TO STA 20+71 AND STA 23+50 TO STA 24+00

MONTANA
TIMOTHY P. RAHN
NO. 8747PE
REGISTERED
PROFESSIONAL ENGINEER

DRAWN TWC DATE 1-94
DESIGNED TPR JOB NO 93-18
APPROVED DLZ FB NO 740

THOMAS, DEAN & HOSKINS INC.
ENGINEERING CONSULTANTS
GREAT FALLS–BOZEMAN–KALISPELL MONTANA
SPOKANE WASHINGTON

REVISIONS
BY ____ DATE ____ DESCR ____
BY ____ DATE ____ DESCR ____
BY ____ DATE ____ DESCR ____

TD&H

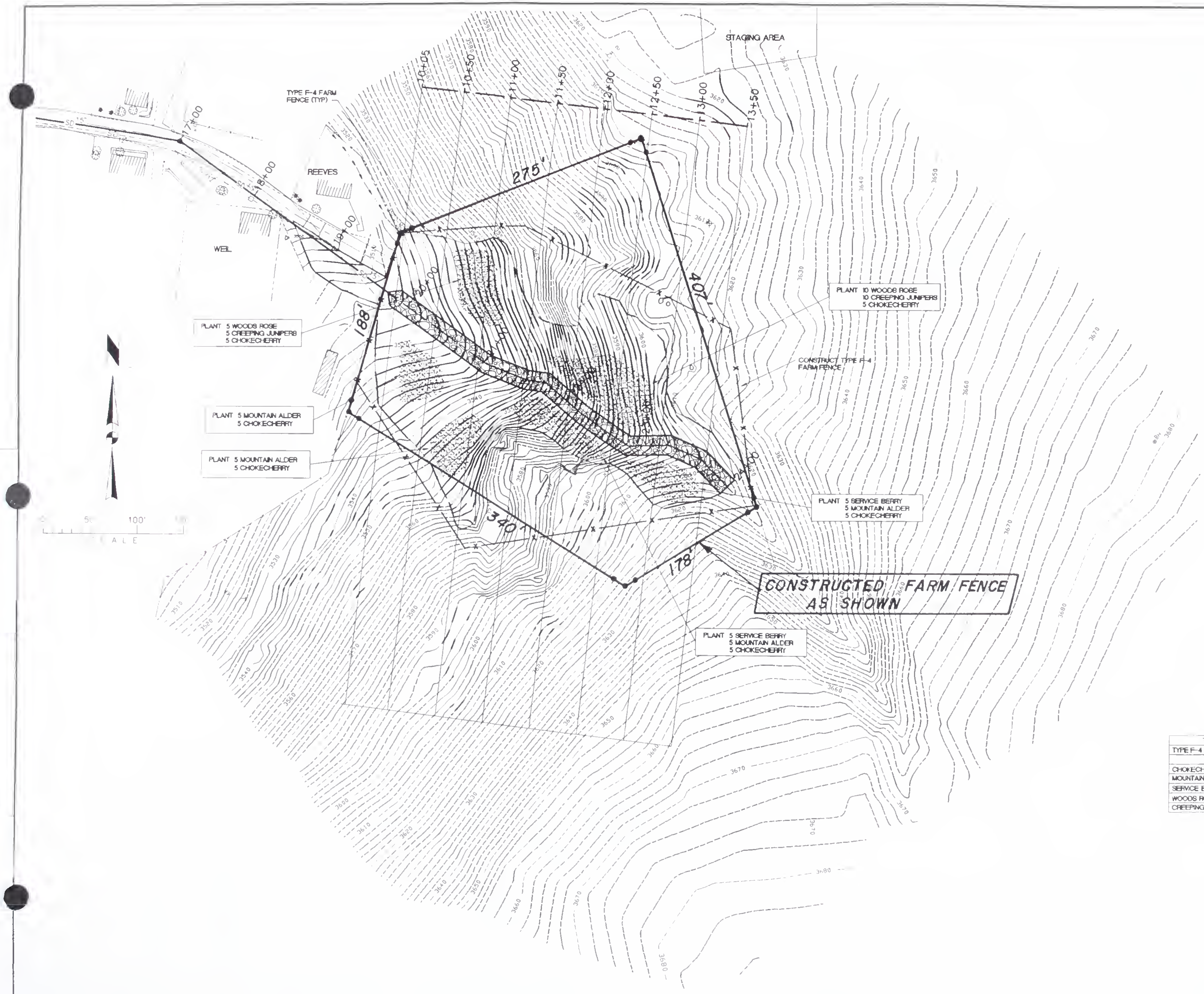
AS–BUILT DRAWING

MONTANA DEPARTMENT OF STATE LANDS–AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA
COULEE STABILIZATION CROSS SECTIONS

SHEETS	SHEET NO
6	4

9318-4 DWG



TOTAL QUANTITIES	
TYPE F-4 FARM FENCE	1235 L.F.
SEEDLINGS	
CHOKECHERRY	30 EA.
MOUNTAIN ALDER	20 EA.
SERVICE BERRY	10 EA.
WOODS ROSE	15 EA.
CREEPING JUNIPER	15 EA.

AS-BUILT DRAWING

MONTANA DEPARTMENT OF STATE LANDS-AMRB
NELSON COAL SITE RECLAMATION

SAND COULEE, MONTANA

COULEE STABILIZATION PLANTING & FENCING PLAN

MONTANA
TIMOTHY ... RAN...
NO. ...PE
REGISTERED
PROFESSIONAL ENGINEER

BY____DATE____DESCR____
BY____DATE____DESCR____
BY____DATE____DESCR____
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TD&H

THOMAS, DEAN & HOSKINS INC
ENGINEERING CONSULTANTS
GREAT FALLS-BOZEMAN-KALISPELL MONTANA
SPOKANE WASHINGTON

6 SHEETS

SHEET NO 5

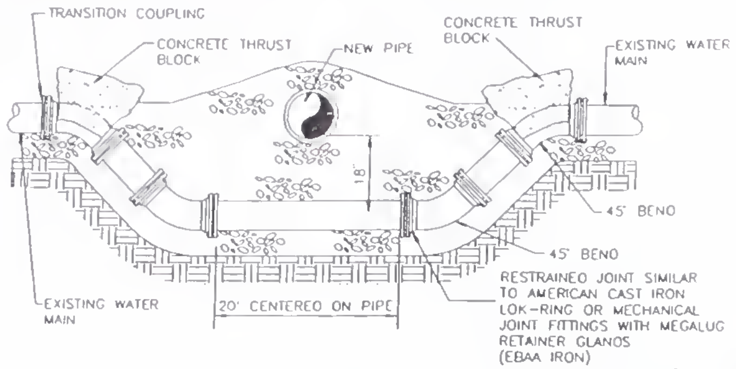
9318-5 DWG

1 ENCASE NEW PIPE FITTINGS WITH 2 PLY POLYETHYLENE PIPE WRAPPING

2 MINIMUM CLEARANCE BELOW NEW PIPE - 1'-6"

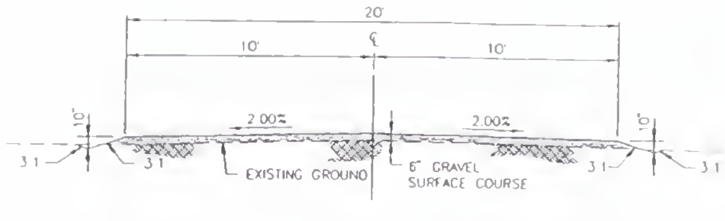
3 BACKFILL CROSSING AREA WITH PIPE BEDDING MATERIAL TYPE 1

4 PIPE SHALL BE PVC CONFORMING TO AWWA C900, DR18

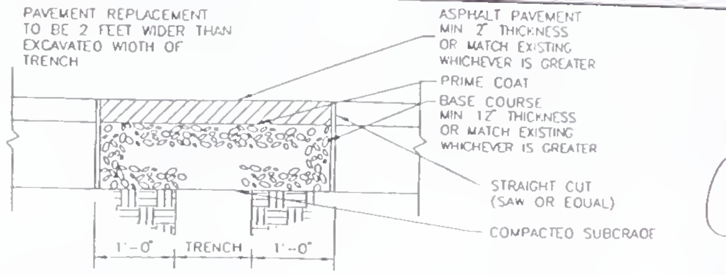


EXISTING WATER LINE ADJUSTMENT DETAIL ① / 6

NO SCALE



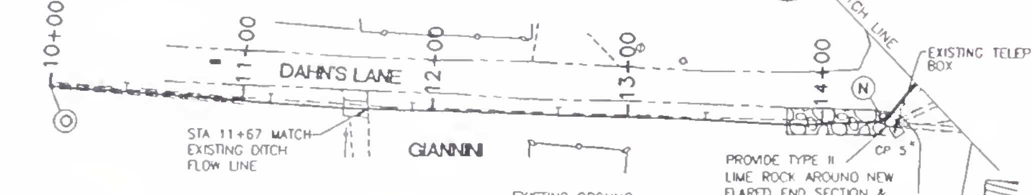
TYPICAL GRAVEL ROAD SECTION

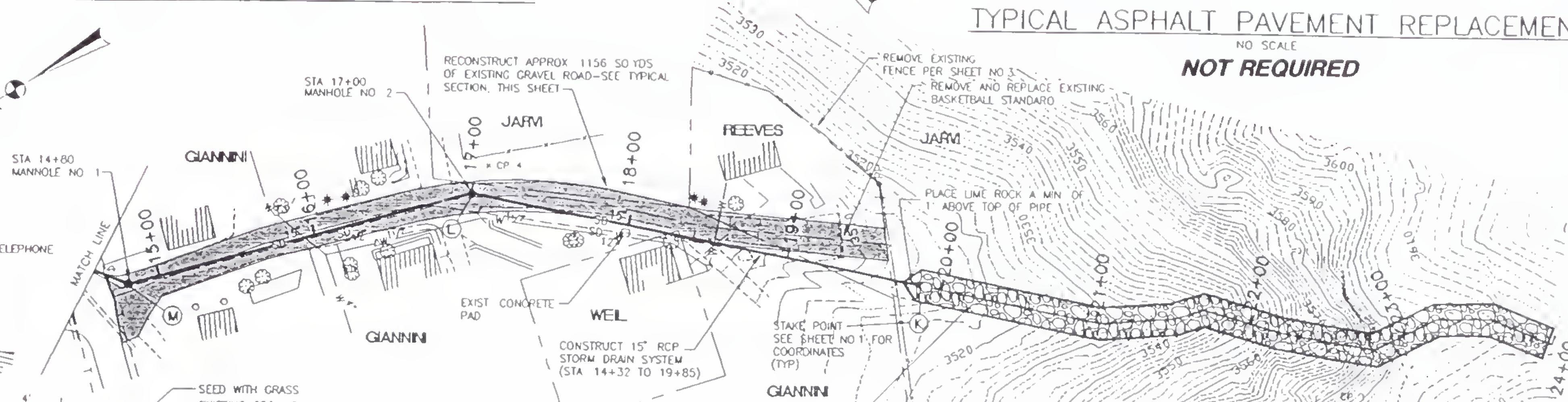

PAVEMENT REPLACEMENT TO BE 2 FEET WIDER THAN EXCAVATED WIDTH OF TRENCH
ASPHALT PAVEMENT MIN 2" THICKNESS OR MATCH EXISTING WHICHEVER IS GREATER
PRIME COAT
BASE COURSE MIN 12" THICKNESS OR MATCH EXISTING WHICHEVER IS GREATER
STRAIGHT CUT (SAW OR EQUAL)
COMPACTED SUBGRADE
1'-0"
TRENCH
1'-0"

TYPICAL ASPHALT PAVEMENT REPLACEMENT

NO SCALE

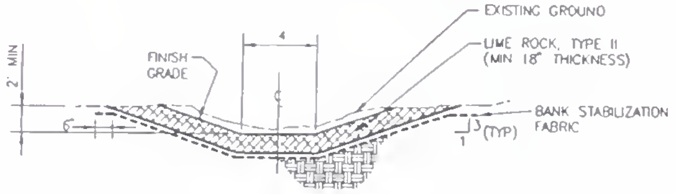
NOT REQUIRED


10+00
11+00
12+00
13+00
14+00
DAHN'S LANE
STA 11+67 MATCH EXISTING DITCH FLOW LINE
GIANNINI
PROVIDE TYPE II LIME ROCK AROUND NEW FLARED END SECTION & EXISTING CULVERTS
CP 3
N
MATCH LINE
EXISTING TELEPHONE BOX


MATCH LINE
STA 14+80 MANHOLE NO 1
15+00
16+00
GIANNINI
STA 17+00 MANHOLE NO 2
RECONSTRUCT APPROX 1156 SQ YDS OF EXISTING GRAVEL ROAD-SEE TYPICAL SECTION, THIS SHEET
JARM
CP 4
18+00
REEVES
19+00
JARM
REMOVE EXISTING FENCE PER SHEET NO 3
REMOVE AND REPLACE EXISTING BASKETBALL STANDARD
PLACE LIME ROCK A MIN OF 1' ABOVE TOP OF PIPE
20+00
21+00
22+00
23+00
24+00
EXIST CONCRETE PAD
WEIL
GIANNINI
CONSTRUCT 15" RCP STORM DRAIN SYSTEM (STA 14+32 TO 19+85)
STAKE POINT SEE SHEET NO 1 FOR COORDINATES (TYP)
GIANNINI
SEE SHEET NO 3 FOR SITE PLAN
K
M
3520
3530
3540
3550
3560
3580
3590
3600
3610
3620
0
50'
100'
150'
SCALE

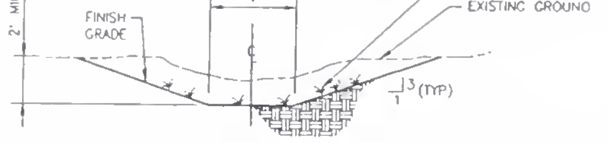
1 WHERE WATER SERVICE LINES REQUIRE ADJUSTMENT TO PROVIDE AT LEAST 12 INCHES CLEARANCE BETWEEN NEW PIPE AND EXISTING SERVICE, EXISTING SERVICE LINE SHALL BE ADJUSTED USING PIPE MATERIALS TO MATCH EXISTING PIPE. ADJUSTMENT SHALL BE MADE SIMILAR TO EXISTING WATER LINE ADJUSTMENT DETAIL SHOWN ON THIS SHEET

NOTE: SEE SHEET NO 4 FOR TYPICAL SECTIONS


EXISTING GROUND
LIME ROCK, TYPE II (MIN 18" THICKNESS)
BANK STABILIZATION FABRIC
FINISH GRADE
2' MIN
4'
3 (TYP)
1

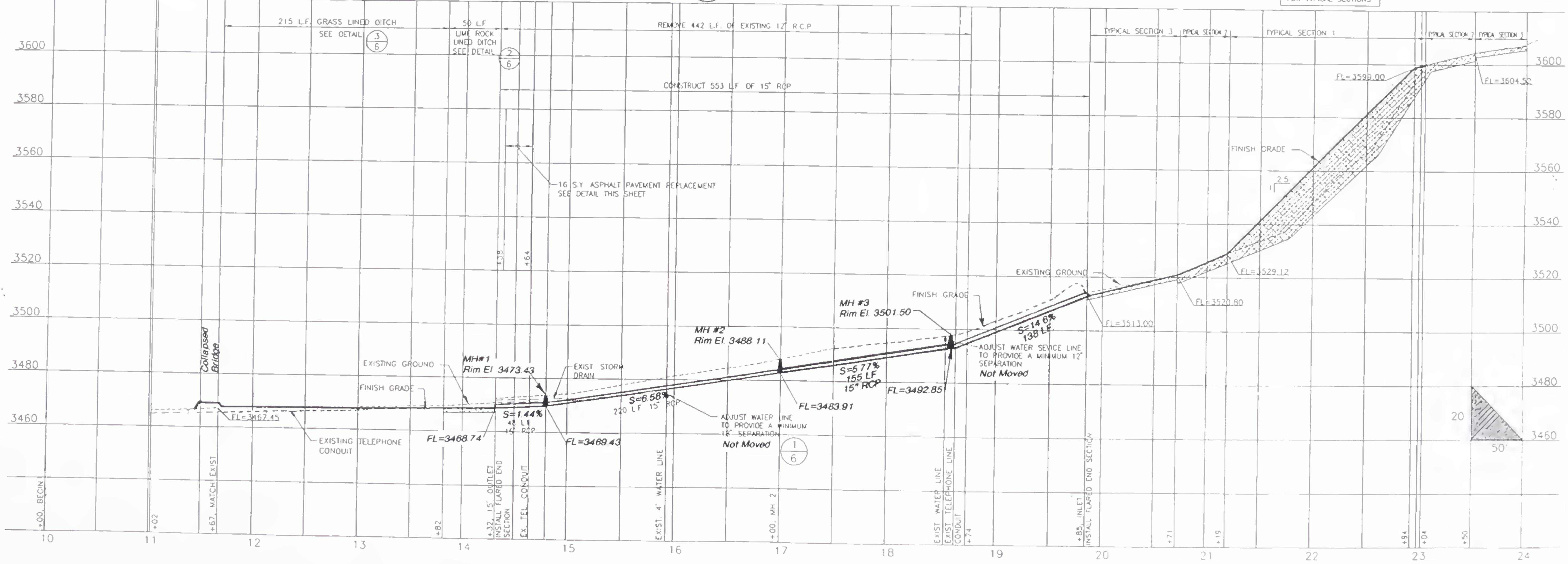
LIME ROCK LINED DITCH DETAIL ② / 6

NO SCALE



GRASS LINED DITCH DETAIL ③ / 6

NO SCALE



MONTANA
TIMOTHY RANF
NO 8342E
PROFESSIONAL ENGINEER

DRAWN TWC DATE 1-94
DESIGNED TPR JOB NO 93-18
APPROVED DLZ F B NO 740

THOMAS, DEAN & HOSKINS INC.
ENGINEERING CONSULTANTS
GREAT FALLS - BOZEMAN - KALISPELL MONTANA
SPOKANE WASHINGTON

REVISIONS
BY ___ DATE ___ DESCR ___
BY ___ DATE ___ DESCR ___
BY ___ DATE ___ DESCR ___

TD&H

AS-BUILT DRAWING

MONTANA DEPARTMENT OF STATE LANDS-AMRB
NELSON COAL SITE RECLAMATION
SAND COULEE, MONTANA
STORM DRAIN PLAN & PROFILE

SHEET 6 OF 6 SHEETS

9318-6 DWG

ATTACHMENT 7

PHOTOGRAPHS/SLIDES

PHOTO LISTING

PHOTOS/SLIDES

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
1	11-01-94	Contractor's equipment - Kenworth tractor with lowboy
2	11-01-94	Contractor's equipment - Caterpillar 966D wheel loader
3	11-03-94	Contractor's equipment - Caterpillar D-8H bulldozer
4	11-01-94	Contractor's equipment - Caterpillar 416 backhoe/loader
5	11-02-94	Contractor's equipment - Case 1845C skid steer loader
6	11-01-94	Contractor's equipment - Lube/fuel truck
7	11-07-94	Contractor's equipment - Bomag BW60S hand guided compactor
8	11-07-94	Contractor's equipment - Caterpillar EL 300 excavator
9	11-23-94	Contractor's equipment - Truck/trailer rigs (sub-contractor)
10	11-30-94	Contractor's equipment - Caterpillar 140 G motor grader
11	11-16-94	Contractor's equipment - Case 995 farm tractor
12	03-22-95	Contractor's equipment - crimper
13	11-01-94	Pre-construction - Area along Miners Lane where 12" stormdrain was located
14	11-01-94	Removing 12" stormdrain
15	11-03-94	Old stormdrain pipe piled in coulee
16	11-03-94	Water main broken near Sand Coulee fire hall
17	11-08-94	Water from broken main flowing into excavation
18	11-03-94	Water main repaired
19	11-01-94	Delivery of new 15" reinforced concrete pipe (RCP) for stormdrain
20	11-01-94	Manufacturer's labeling on the RCP
21	11-01-94	Unloading concrete pipe
22	11-10-94	Cut and grade stake for manhole #2
23	11-02-94	Starting stormdrain excavation at manhole #2
24	11-02-94	Laying pipe for 15" stormdrain
25	11-03-94	Installing manhole

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
26	11-03-94	Checking water main deflection below stormdrain
27	11-03-94	Water main deflection area filled to stormdrain grade
28	11-04-94	View of stormdrain trench with section partially filled and compacted around the concrete pipe
29	11-04-94	Backfilling stormdrain trench
30	11-07-94	Setting manhole #2 in-place
31	11-07-94	View of various stormdrain installation operations
32	11-10-94	Hand work around manhole #3 with water service line in the picture
33	11-11-94	Upper section of Miners Lane with stormdrain installed
34	11-11-94	Cleaning-out ditch (basin) along Dahn's Lane
35	11-15-94	Installing limestone and filter fabric in ditch (basin) along Dahn's Lane
36	03-22-95	Stormdrain outlet in ditch (basin) along Dahn's Lane
37	11-01-94	Pre-construction view of Miners Coulee
38	11-04-94	Starting to cut trench down center of coulee
39	11-09-94	Rock excavation on south side of coulee
40	11-09-94	Terracing south side of coulee
41	12-01-94	Terracing north side of coulee
42	11-08-94	Lime rock delivery from Winston
43	11-16-94	Stockpiling lime rock
44	11-22-94	Loading lime rock
45	11-14-94	Building lime rock core
46	11-14-94	Lime rock on bank stabilization fabric
47	11-22-94	Excavator receiving load of lime rock
48	12-07-94	Dumping load of lime rock onto bank stabilization fabric in channel section
49	12-08-94	Finishing west end of channel

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
50	03-21-95	Covering exposed fabric with lime rock near inlet to stormdrain
51	03-22-95	Upper end of lined channel completed
52	12-02-94	Dumping load of imported fill
53	03-20-95	Grading upper end of coulee
54	03-20-95	Grading upper end of coulee
55	12-06-94	Imported cover soil stockpile
56	12-06-94	Dumping and spreading imported cover soil
57	12-06-94	Loading cover soil
58	12-07-94	Miners Coulee dressed with imported cover soil
59	12-08-94	Drill seeding north side of coulee
60	12-08-94	Drill seeding south side of coulee
61	03-20-95	Seedbed prepared along upper end of Miners Lane
62	12-06-94	Delivery of straw bales
63	12-06-94	Installing straw bale dike along perimeter of rock core
64	12-08-94	Spreading straw mulch
65	12-08-94	Crimping mulch
66	12-08-94	Tracking mulch
67	12-08-94	Mulch on north side of lime rock core and view of straw bale dike
68	12-08-94	South side of coulee mulched
69	12-08-94	North side of Miners Coulee mulched
70	03-21-95	Crimping at head of coulee
71	03-21-95	Hand work near head of drainage
72	12-13-94	Woods Rose shrub planting
73	12-10-94	Mixing peat moss and fertilizer for shrub planting
74	12-10-94	Planting Creeping Juniper

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
75	12-13-94	Shrub planted
76	12-10-94	Woods Rose in containers
77	12-10-94	Creeping Juniper in containers
78	12-02-94	Double panel and fence on north side of Miners Coulee
79	12-13-94	Panel at southwest corner of Miners Coulee
80	03-21-95	Looking southeast along fence
81	03-21-95	Post-construction view of Miners Coulee looking southwest
82	03-21-95	Post-construction view of coulee looking up Miners Lane
83	03-22-95	Post-construction view of north side of coulee
84	03-22-95	Post-construction view of south side of coulee
85	03-22-95	Post-construction view of revegetated area along Miners Lane
86	03-20-95	Post-construction view of Miners Lane
87	03-22-95	Post-construction view of lime rock stockpile area near fire hall
88	12-13-94	Post-construction view of exposed seep on terraced area along coal seam
89	12-13-94	Post-construction view of seep along terrace
90	11-15-94	Pre-construction view of boulder over shaft subsidence
91	11-15-94	Pre-construction view of shaft subsidence below boulder
92	03-22-95	Post-construction view of backfilled shaft
93	11-02-94	Pre-construction view of subsidence hole #1
94	11-11-94	Subsidence hole #1 filled and dressed with cover soil
95	03-22-95	Post-construction view of subsidence hole #1
96	11-02-94	Pre-construction view of subsidence hole #3
97	03-22-95	Post-construction view of subsidence holes #2 and #3
98	11-02-94	Pre-construction view of subsidence hole #4
99	03-21-95	Post-construction view of subsidence holes #4

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
100	11-02-94	Pre-construction view of subsidence hole #5
101	11-07-94	Dumping gravel into subsidence hole #5
102	03-21-95	Post-construction view of subsidence holes #4
103	03-21-95	Post-construction view of subsidence holes #8
104	11-02-94	Pre-construction view of subsidence hole #6
105	11-02-94	Pre-construction view of subsidence hole #7
106	11-02-94	Subsidence holes #6-7 with cover soil salvaged
107	11-08-94	Subsidence holes #6-7 filled with gravel
108	11-02-94	Pre-construction view of subsidence hole #9
109	03-20-95	Post-construction view of subsidence holes #9
110	11-02-94	Pre-construction view of subsidence hole #10
111	03-21-95	Post-construction view of subsidence holes #10
112	11-02-94	Pre-construction view of subsidence hole #11
113	11-07-94	Recovering soil from subsidence holes #11
114	11-02-94	Pre-construction view of subsidence hole #12
115	11-02-94	Pre-construction view of subsidence hole #13
116	11-02-94	Pre-construction view of subsidence hole #14
117	03-21-95	Post-construction view of subsidence hole #14
118	11-02-94	Pre-construction view of subsidence hole #15
119	11-02-94	Pre-construction view of subsidence hole #16
120	11-02-94	Pre-construction view of subsidence hole #17
121	03-22-95	Post-construction view of subsidence hole #17
122	11-02-94	Pre-construction view of subsidence hole #19
123	03-21-95	Post-construction view of subsidence hole #19

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
124	03-21-95	Post-construction view of subsidence hole #18
125	11-02-94	Pre-construction view of subsidence hole #20
126	11-02-94	Pre-construction view of subsidence hole #21
127	03-21-95	Post-construction view of subsidence holes #20-#21
128	11-01-94	Pre-construction view of subsidence hole #22
129	03-21-95	Post-construction view of subsidence hole #22
130	11-01-94	Pre-construction view of subsidence hole #23
131	03-21-95	Post-construction view of subsidence hole #23
132	11-01-94	Pre-construction view of subsidence hole #24
133	03-21-95	Post-construction view of subsidence hole #24
134	11-01-94	Pre-construction view of subsidence hole #25
135	11-02-94	Salvage soil from subsidence hole #25
136	11-01-94	Pre-construction view of subsidence hole #26
137	11-01-94	Pre-construction view of subsidence hole #27
138	11-01-94	Pre-construction view of subsidence hole #28
139	11-01-94	Pre-construction view of subsidence hole #29
140	11-01-94	Pre-construction view of subsidence hole #30
141	03-22-95	Post-construction view of subsidence holes #28, #29, & #30
142	11-07-94	Pre-construction view of crack #1
143	11-15-94	Post-construction view of crack #1
144	11-07-94	Pre-construction view of crack #2
145	11-10-94	Crack #2 after excavation
146	11-15-94	Post-construction view of crack #2
147	11-08-94	Pre-construction view of crack #11
148	11-07-94	Pre-construction view of crack #3

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
149	11-15-94	Post-construction view of crack #3
150	11-07-94	Pre-construction view of crack #4
151	11-15-94	Post-construction view of crack #4
152	11-08-94	Pre-construction view of crack #5
153	11-15-94	Post-construction view of crack #5
154	11-08-94	Pre-construction view of crack #6
155	11-15-94	Post-construction view of crack #6
156	11-08-94	Pre-construction view of crack #7
157	11-15-94	Post-construction view of crack #7
158	11-08-94	Pre-construction view of crack #8
159	11-15-94	Post-construction view of crack #8
160	11-08-94	Pre-construction view of crack #9
161	11-08-94	Pre-construction view of cracks #10A & # 10B
162	11-15-94	Post-construction view of cracks #9 & #10A
163	11-16-94	Post-construction view of crack #10B
164	11-08-94	Pre-construction view of crack #12
165	11-10-94	Cover soil salvaged from crack #12
166	11-11-94	Crack #12 excavated and filled with gravel
167	11-16-94	Post-construction view of crack #12
168	11-08-94	Pre-construction view of crack #13
169	11-10-94	Crack #14 excavated
170	11-14-94	Cracks #13 & #14 filled and graded
171	11-16-94	Post-construction view of cracks #13 & #14
172	11-08-94	Pre-construction view of crack #15
173	11-10-94	Crack #15 excavated

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
174	11-08-94	Pre-construction view of crack #16
175	11-10-94	Crack #16 excavated
176	11-08-94	Pre-construction view of crack #17
177	11-09-94	Crack #17 excavated
178	11-11-94	Backfilling crack #17
179	11-14-94	Crack #17 regraded
180	11-16-94	Crimping mulch on crack #17
181	11-08-94	Pre-construction view of crack #18
182	11-11-94	Cracks #17 & #18 backfilled
183	11-16-94	Spreading straw mulch on cracks #17 & #18
184	11-08-94	Pre-construction view of crack #19
185	11-10-94	Excavating crack #19
186	11-11-94	Crack #19 backfilled
187	11-07-94	Pre-construction view of crack #20 from bottom
188	11-07-94	Pre-construction view of crack #20 from top
189	11-11-94	Excavating crack #20
190	03-21-95	Post-construction view of crack #20
191	11-07-94	Pre-construction view of crack #21
192	03-21-95	Post-construction view of crack #21
193	11-02-94	Pre-construction view of crack #23
194	11-11-94	Crack #23 excavated
195	11-02-94	Pre-construction view of crack #22
196	11-02-94	Pre-construction view of crack #24
197	11-02-94	Pre-construction view of crack #25
198	03-21-95	Post-construction view of crack #25

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
199	11-02-94	Pre-construction view of crack #26
200	03-21-95	Crack #26 backfilled
201	11-02-94	Pre-construction view of crack #27
202	03-21-95	Crack #27 backfilled
203	11-02-94	Pre-construction view of crack #28
204	11-07-94	Pre-construction view of crack #29
205	11-11-94	Crack #29 excavated
206	11-07-94	Pre-construction view of crack #30
207	11-07-94	Pre-construction view of crack #31
208	03-22-95	Construction road reclamation
209	03-22-95	Construction road reclamation
210	03-22-95	Construction road reclamation
211	04-26-95	Miners Lane before pavement repair
212	04-26-95	Looking south at Dahn's Lane before pavement repair
213	04-26-95	Looking north at Dahn's Lane before pavement repair
214	04-26-95	Pavement repair - paving temperature
215	04-26-95	Pavement repair - time temp. reading taken
216	04-26-95	Pavement repair - milling along Main St.
217	04-26-95	Pavement repair - brooming along Main St.
218	04-26-95	Pavement repair - milling near Post Office
219	04-26-95	Pavement repair - excavating along pipe trench
220	04-26-95	Pavement repair - brooming Miners Lane
221	04-26-95	Pavement repair - milling on Dahn's Lane
222	04-26-95	Pavement repair - milling along driveway
223	04-26-95	Pavement repair - milling on Dahn's Lane

NELSON COAL SITE RECLAMATION PROJECT
PHOTO & SLIDE DESCRIPTIONS

ASSIGNED NUMBER	DATE TAKEN	SUBJECT OR COMMENTS
224	04-26-95	Pavement repair - Riverside's tack truck
225	04-26-95	Pavement repair - spraying tack oil
226	04-26-95	Pavement repair - Miners Lane with tack oil
227	04-26-95	Pavement repair - spreading mix
228	04-26-95	Pavement repair - starting to pave
229	04-26-95	Pavement repair - laying blacktop
230	04-26-95	Pavement repair - rolling blacktop
231	04-26-95	Pavement repair - trench patch
232	04-26-95	Pavement repair - Miners Lane paved
233	04-26-95	Pavement repair - Dahn's Lane paved

CONTRACTORS EQUIPMENT

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REMOVE 12" STORM DRAIN

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REPAIR
WATER MAIN

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INSTALL 15" STORM DRAIN

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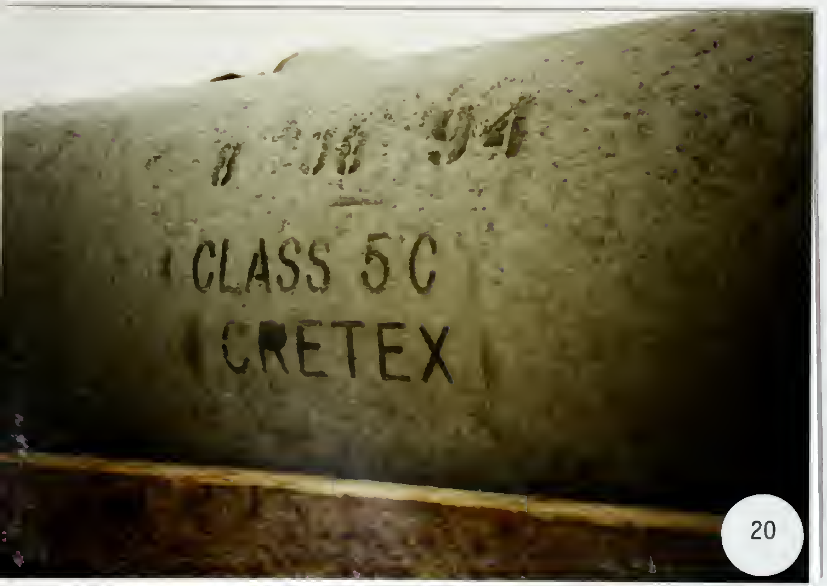

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STORM
DRAIN OUTLET

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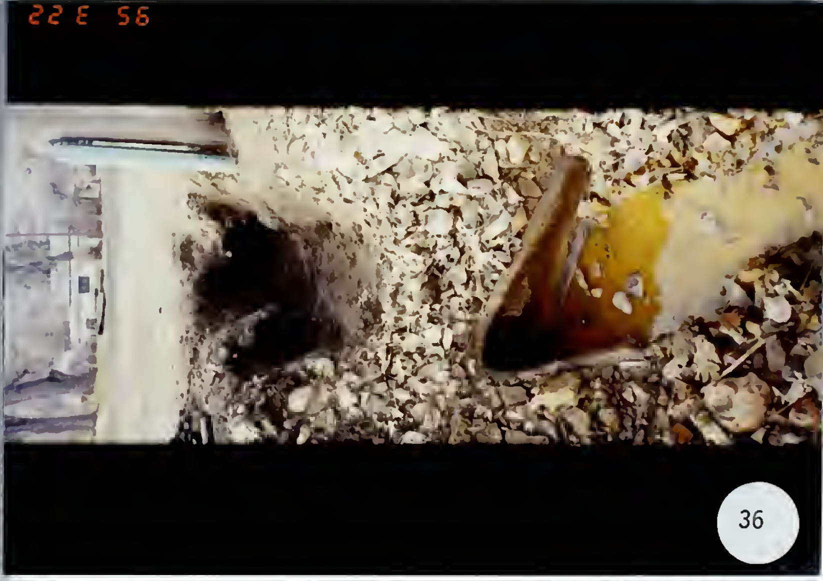

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MINERS COULEE
STABILIZATION

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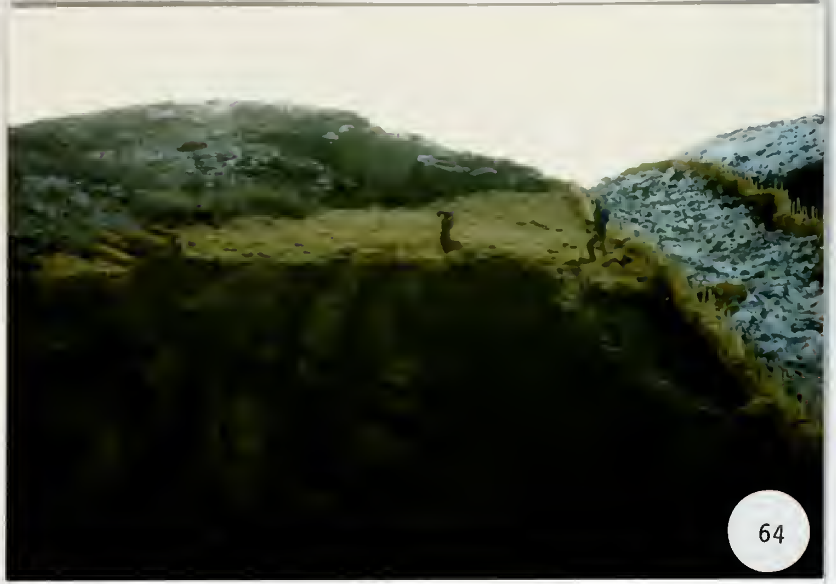
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FENCING

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MINERS COULEE
POST CONSTRUCTION

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SHAFT BACKFILLING

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SUBSIDENCE
HOLE
RECLAMATION

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CRACK BACKFILLING

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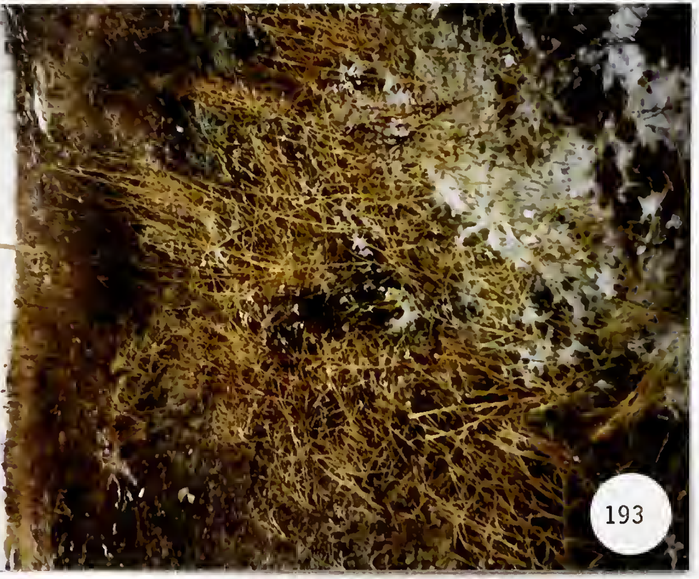
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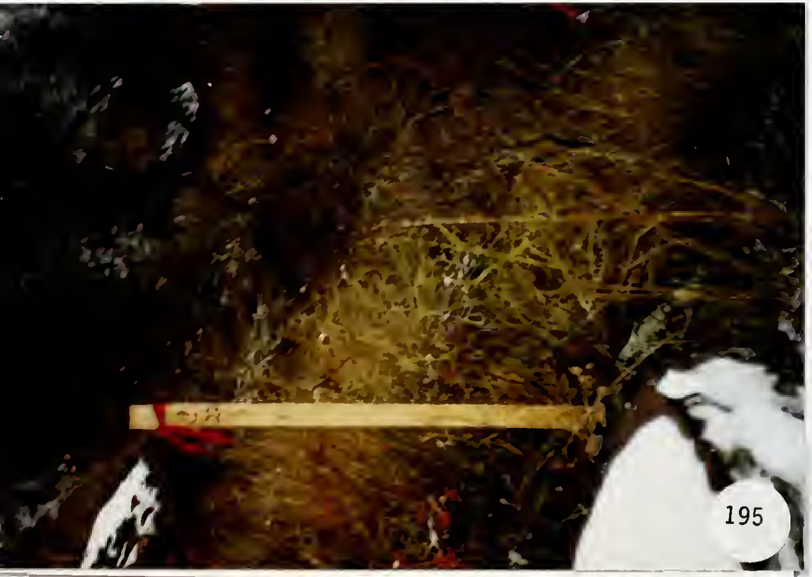
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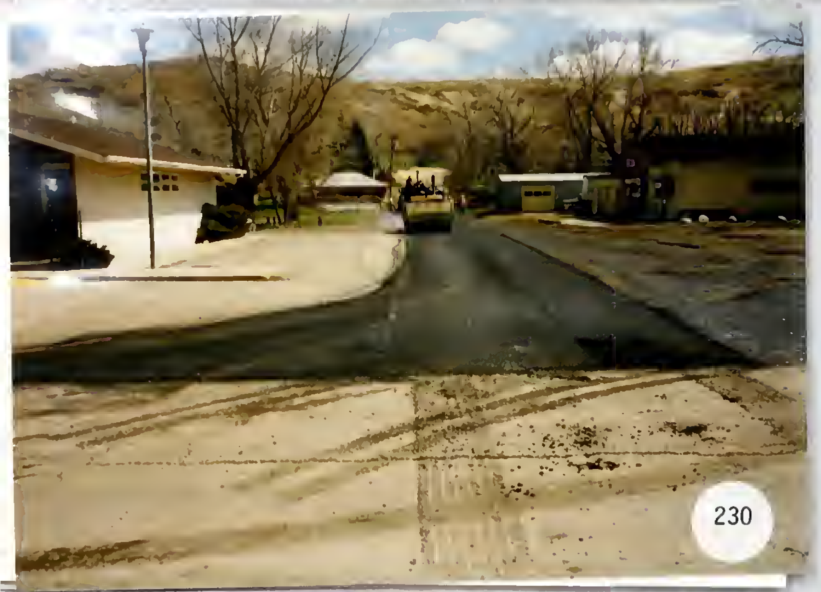
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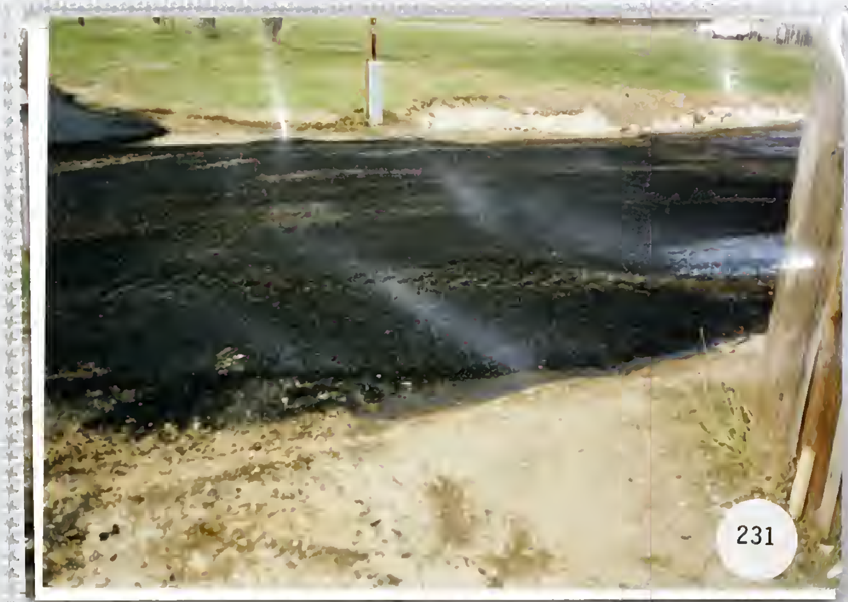
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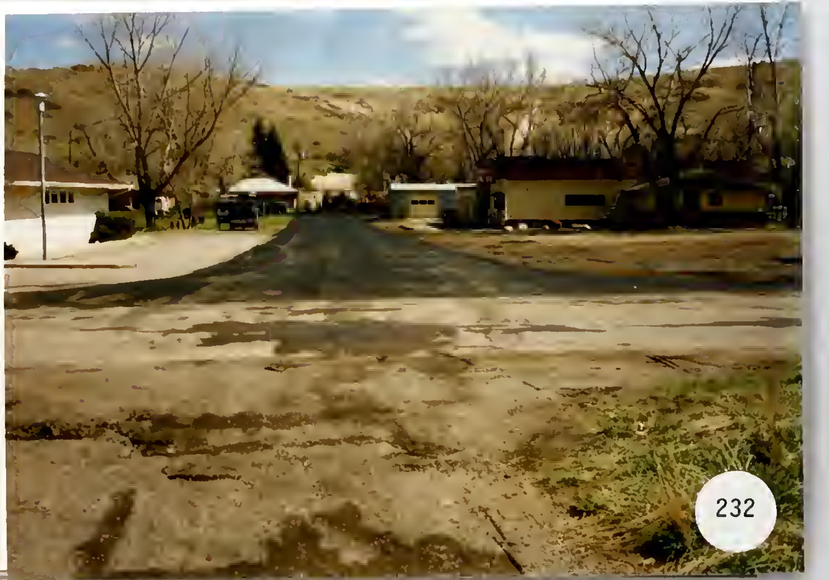
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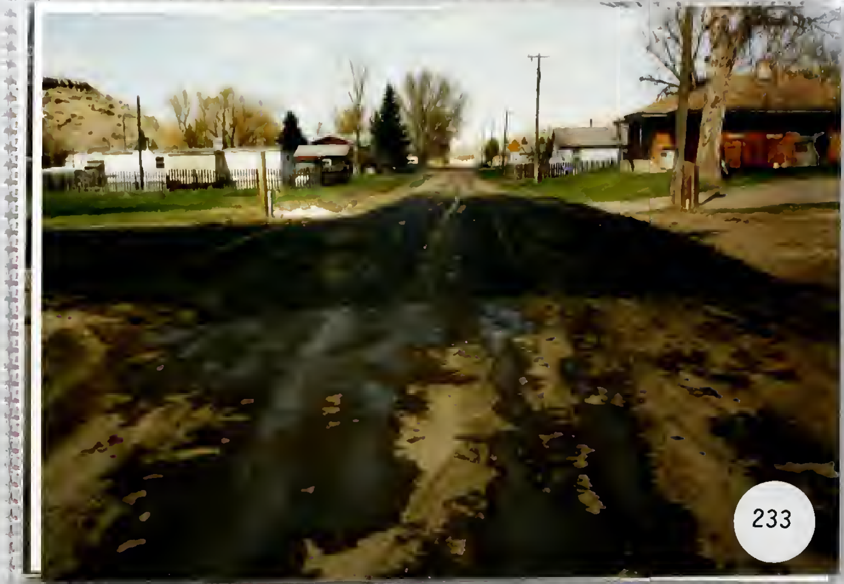
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